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ENVIRONMENTAL MANAGEMENT STRATEGIES  
IN PUBLIC SECTOR ORGANIZATIONS

THESIS

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Captain, USAF

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Presented to the Faculty of the Graduate School of Engineering  
of the Air Force Institute of Technology  
Air University  
In partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Engineering and Environmental Management

Charles P. Roberts, B.S.

Captain, USAF

March 1999

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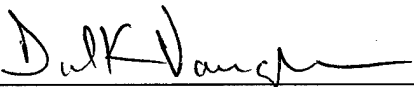
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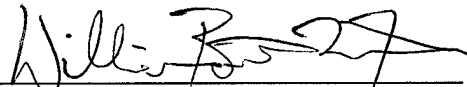
THESIS


Captain Charles P. Roberts

Presented to the Faculty of the Graduate School of Engineering  
of the Air Force Institute of Technology

In Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Engineering and Environmental Management

  
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## Abstract

Environmental management research investigates environmental and ecological practices in organizations. Environmental strategy models or typologies are developed to classify organizations according to their environmental and ecological practices. Past research for environmental management strategy has focused on the profit sector versus the public sector. Drivers such as market and financial forces may not be as evident in the public sector as they are in the profit sector.

This research explored environmental management strategies in public sector organizations. An environmental management strategy typology was developed to investigate the structural aspects of organizations. The typology and respective instrument were used in a case study of the U.S. Air Force. Document reviews and personal interviews were utilized to effect the categorization in the case study. Of the five developed strategies (*inactive, reactively compliant, proactively compliant, preventive, assertive*), the study found environmental policies, goals and objectives, and funding to have a strategic response of *proactively compliant*. Environmental training and management structure were found to have a strategic response of *preventive*.

# ENVIRONMENTAL MANAGEMENT PARADIGMS IN PUBLIC SECTOR ORGANIZATIONS

## I. Introduction

### A. Background

It is generally accepted that concern for the growth of modern environmentalism started with the release of *Silent Spring* in 1962. This book provided a foundation for concern over the impact of human activities on the environment by detailing the environmental effects of unrestricted pesticide use. With the publication of *Limits to Growth* in 1979, concern grew from mankind's impact on the environment to that of whether our environment could sustain us in the future. Society is becoming more aware of the significant impact that we can have on the environment in which we live.

Organizations have undergone a similar growth in environmental awareness. Originally, organizations had little concern for their impact on the environment. Many industries (such as lumber, steel, and chemical) enjoyed the economic benefits of utilizing the environment but assumed little or no responsibility for the environmental burden they created. Due to a myriad of factors, organizations began to realize their impact on the environment and engaged in more environmentally friendly processes.

The progression of environmental management development can be expressed on a continuum or spectrum. The environmental continuum is composed of stages, referred to as strategies, that describe societal or organizational attitudes and actions for the environment. Several theorists have developed models or topologies that encompass

their particular stages of environmental program development. The following (Fig. 1) illustrates a typology with the use of the environmental continuum with respect to strategies:

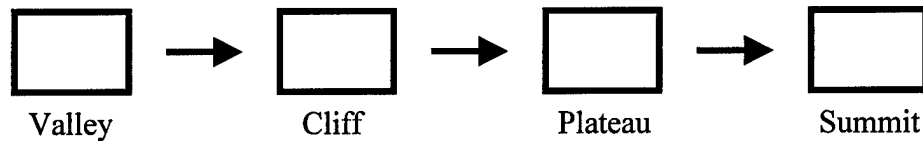


Figure 1. Environmental Continuum with Stages of Environmental Program Development (Byrne and Kavanagh, 1996)

Realizing that society as well as organizations has progressed along the environmental continuum, one question is what drives an organization to become more environmentally friendly in behavior and actions? Most research in this area focuses on profit sector organizations and the environmental strategies that they exhibit (Fischer and Schot, 1993: 3-33; Reinhardt and Vietor, 1996: 1-53 - 1-69; Hass, 1996: 59-68). Little research has investigated public sector organizations and the environmental continuum. In differentiating between the public and profit sector, public sector organizations are “those created by law whose job it is to administer the law and whose budget support comes from the public in the form of taxes” (Vasu, 1990: 4). In contrast, profit sector organizations are market organizations that rely on supply and demand for their goods and services to make a profit. Similar characteristics can be argued for the two types of organizations, but they differ fundamentally (Vasu, 1990: 5).

When considering the impact of public organizations on the environment, one begins to realize that there is a definite need to further investigate organizational environmental management in the public sector. For example, as a public sector organization, the Air Force accounted for over 2.1 million pounds of on- and off-site releases of toxic substances as published in the 1996 Toxic Release Inventory report. The Air Force also reported over 2.7 million pounds of total production-related waste. For federal facilities, these totals are first (31.7% of federal total) and third (5.7% of federal total) for on- and off-site releases and total production-related waste categories, respectively (EPA, 1996: 376). Due to the large environmental impact of public sector organizations, this research is focused on the public sector, and more specifically, the Air Force and its organizational environmental management.

## **B. Research Objectives**

With increased environmental awareness and increasingly restrictive environmental laws, both public and profit sector organizations have realized a need to take a proactive role in environmental matters. Various forces have compelled organizations to embrace different environmental paradigms and strategies. When considering public sector organizations, some of the forces for progressing along the environmental continuum are not as evident as in the profit sector. This research effort investigates these factors in relation to environmental strategies. In the following chapters, this research develops an appropriate environmental strategy typology to analyze public sector organizations and

uses it to investigate Air Force environmental management as a public sector organization.

This research first investigates previous literature to differentiate public and profit sector organizations. This literature provides a basis for the development of a new environmental strategy typology appropriate for classifying public sector organizations. Then, a case study of Air Force environmental management is accomplished to investigate environmental management strategies present in the public sector. Specific investigative questions to guide the overall research objective include:

1. What is an appropriate environmental strategy typology for investigating responses in public sector organizations?
2. How can one investigate structural aspects of an organization?
3. What environmental strategy do the structural aspects of Air Force environmental management reflect?



## **II. Literature Review**

### **A. Introduction**

This literature review provides a theoretical foundation for the specific research being accomplished. It first discusses environmental management theory and the various strategy and paradigm schemes presented in the literature. The literature review then discusses the drivers to progressing along the environmental continuum. Last, the literature review examines the differences between public and profit sector organizations and investigates the different drivers they possess in the context of the environmental continuum.

### **B. Environmental Management Theory**

Contributing to environmental management theory, theorists study the degree to which organizations implement environmental and ecological practices (Ee, 1997: 11). In determining the degree to which an organization implements these practices, classifications exist. As discussed previously, these classifications are considered as strategies. Environmental strategies are regarded as responses that can be utilized to classify environmental management in organizations along a spectrum or continuum of environmental commitment. Classifying organizations on this continuum allows comparison. Public awareness groups, scholars, and the general public can also gain an understanding of the environmental commitment of an organization by its associated environmental strategy (Ee, 1997: 15). Many environmental strategy models in the

literature aim to classify organizations according to their environmental commitment (Hass, 1996; Ee, 1997; Colby, 1989; Hunt and Auster, 1990).

Before the current emphasis on environmentalism, organizations often viewed natural resources as infinite and readily available for human exploitation and consumption. Colby (1989) expresses this paradigm as *frontier economics*. Relying on an earth and mankind relationship context, Gladwin, Kennelly, and Krause (1995: 882-886) view this early perspective as *technocentrism*, where people believe they can solve environmental problems through technology, and view themselves as removed and above the environment. Beaumont, Pedersen, and Whitaker (1993: 67) label this perspective as *ignored*, where organizations do not consider environmental matters. Analogous to the *ignored* paradigm is the *beginner* response (Hunt and Auster, 1990: 9-10), where environmental management is viewed as unnecessary and managers are not involved in environmental matters.

Progressing along the environmental continuum, organizations begin to take a reactive approach to legislative requirements. Hunt and Auster (1990: 9-11) classify organizations with this approach as *firefighters*. James (1992: 111) uses the label of *impact amelioration* in this stage to describe organizations which do only what is necessary to comply with regulatory and legislative standards. These organizations are considered as *reactive* (Newman, 1993: 32), and view environmental issues as isolated concerns but not as important business elements.

Further along the environmental continuum, organizations then consider the environmental impact of their actions. They realize the financial implications of their

environmental actions and work on reducing this cost. Actions during this stage include pollution prevention initiatives as an end-of-pipe process for cost savings, as well as recycling and reduced energy consumption. Compliance is still a primary focus, though. James (1992: 111) uses the term *corporate responsibility* to describe this stage since organizations are starting to move beyond legislation and develop their own initiatives. Dodge (Welford, 1995: 193) describes this stage as *accommodate*, where organizations are moving beyond compliance into voluntary action.

Moving into the more progressive stages of environmental management, organizations begin to utilize their environmental management systems to take more innovative strategies. Organizations are aware of and seize the competitive advantage of environmentally safe products and services in their market. Steger (1993: 152) describes this response as *innovative*. As part of this stage on the continuum, organizations are also concerned with managing the human and ecological risks associated with their processes.

Theorists suggest the next stage of organizational environmental management is a movement to *sustainable development* (Welford, 1996: 3-5). Under the paradigm of sustainable development, organizations consider the environment as an integral part of the economic process. Organizations strive to meet the needs of the present without hindering future generations from meeting their needs (Brundtland, 1987). *Ecological sustainability* is another stage of the environmental continuum where sustainable development is applied not only to mankind, but also to other populations and organizations (Starik and Rands, 1995: 909).

### **C. Environmental Drivers**

Realizing that there are fundamental differences in public and profit sector organizations, one can further investigate what drives these differentiated organizations to progress along the environmental continuum. Drivers for environmental progression include regulatory, credibility, market, financial, and internal forces (Schot and Fischer, 1993: 4-5; Reinhardt and Victor, 1996: 1-59).

Regulatory drivers encompass local, state, and federal laws that force organizations to comply with environmental guidelines. Examples include Toxics Release Inventory (TRI) reporting under the Emergency Planning and Community Right-to-Know Act, as well as permitting requirements under the Clean Air Act Amendments. In the "Era of Resistant Adaptation," 1970-1985, regulatory drivers were considered the largest motivation for organizations to progress along the environmental continuum (Schot and Fischer, 1993: 3-33; Reinhardt and Victor, 1996: 1-53 to 1-69). Organizations were made to comply with applicable laws in their industry, and if found out of compliance, often large fines were levied on the culprits.

Credibility relates how an organization is viewed by the public, consumers, and regulators. These external groups play a significant role in affecting the credibility of an organization. As environmental awareness continues to grow, organizations become more susceptible to the pressures of these external groups. Organizations market themselves as environmentally friendly to satisfy this pressure, but actions at times become louder than words. Organizations that falsely make environmental claims often come under the scrutiny of public interest groups that quickly work to hurt the credibility

of these organizations (Coddington and Frankel, 1994: 654). These external groups pressure the organizations to make them accountable to their environmental claims and actions.

Market drivers can also stimulate organizations to progress along the environmental continuum. Market drivers encompass industrial as well as individual consumers (Schot and Fischer, 1993: 3-33; Reinhardt and Vietor, 1996: 1-53 to 1-69). As the Roper and S.C. Johnson survey indicated, individual consumers are becoming more "green" in their purchasing of products, and some are willing to pay a premium for environmentally friendly products (Coddington and Frankel, 1994: 648). Industrial consumers are no exception. Realizing the marketing benefits of green products, industrial consumers are placing environmental requirements on their suppliers (Schot and Fischer, 1993: 3-33; Reinhardt and Vietor, 1996: 1-53 to 1-69). With the demand for green products rising, companies such as StarKist and Xerox are gaining competitive advantage over their competitors (Reinhardt and Vietor, 1996: 1-58).

Financial pressures can also stimulate an organization to progress along the environmental continuum. Investors and insurers are realizing the liabilities associated with environmental actions and critically review prospective client organizations accordingly (Barghava and Welford, 1996:125-126; Schot and Fischer, 1993: 5). Furthermore, investors and insurers are not only concerned about a prospective client's current actions, but what future environmental actions the client is considering. Investors and insurers want to know that their clients' actions will not become a future liability in the foreseeable future.

Other drivers for progressing along the environmental continuum are internal. Internal drivers include an organization's structure and culture. Structure encompasses such management aspects as organizational policies, goals, management systems, processes, and hierarchy. Culture refers to the beliefs and associated patterns of behavior harbored within the organization as an entity as well as with the individuals within that organization. For structural aspects, organizations can be guided to a more progressive program through implementing and adhering to environmentally proactive goals as well as implementing a proactive environmental management system. Through the cultural aspect, an organization's employees and leadership can internalize and adhere to environmentally proactive decisions (Reinhardt and Vietor, 1996: 1-59).

Delving further into structural aspects, organizations have begun to accept and implement the ISO 14000 series environmental management standards. The ISO 14000 series of standards was developed from a field of international and technical experts through "a process of extensive discussion, negotiation, and international consensus" (Cascio, Woodside, and Mitchell, 1996: 7). With a focus on quality environmental management, the ISO 14000 series standards include such structural aspects as policy development, planning with goals and objectives, and program implementation with training and communication. It is generally accepted that as organizations further accept and implement the ISO 14000 series guidelines and its structural aspects, "the result will 'raise the floor' on overall environmental management and performance" (Cascio, Woodside, and Mitchell, 1996: 4). This current emphasis on ISO 14000 series standards in environmental management and their incorporation of structural aspects lends credence

to further investigation of structural drivers for progressing organizations in the environmental continuum.

#### **D. Public versus Profit Sector Organizations**

Public sector organizations are “those created by law whose job it is to administer the law and whose budget support comes from the public in the form of taxes” (Vasu, 1990: 4). Fundamentally, public sector organizations are empowered by law for the goal to provide a public service. Furthermore, public sector organizations are held accountable by that public. In contrast, profit sector organizations are market organizations that rely on supply and demand for their goods and services to make a profit. The fundamental goal of a profit sector organization is profit maximization to survive in the market place (Vasu, 1990: 5).

In the realm of organizational environmental theory, there has been limited research on the differences between the public and profit sector. Using developed paradigms in an environmental continuum, Ee (1997) categorized public and profit sector organizations based on analyzing their published environmental reports. Though his data were limited, his work did indicate a difference among the two sectors. Public sector organizations were evaluated as not being as environmentally proactive as profit sector organizations, especially when considering a public sector organization versus a profit (product oriented) organization (Ee, 1997: 141).

In further delineating public and profit sector organizations, researchers have investigated several other characteristics of organizations. Their assertions and findings

of describing the differences between the public and profit sector can be categorized alongside with the environmental drivers (regulatory, credibility, market, financial, and internal). The following paragraphs outline those previous assertions and findings with regards to the environmental drivers.

**1. Regulatory Issues.** Public sector organizations are subject to many formal and legal constraints that are not as prevalent in profit sector organizations. Profit sector organizations work in the bound of legal and regulatory guidelines, while public sector organizations are often subject to not only these legal and regulatory guidelines, but more hierarchical and/or bureaucratic external controls (Dahl and Lindblom, 1953: 16). These hierarchical and bureaucratic external controls are attributed to the system of checks and balances built into the political framework (Rainey, Backoff, and Levine, 1976: 238).

In an environmental context, the greatest regulatory difference between public and profit sector organizations is the enforcement of the National Environmental Policy Act (NEPA) of 1969. Under its environmental impact statement provision, NEPA establishes the requirement that federal agencies “must consider the environmental effects of, and any alternatives to, all proposals for major federal actions that significantly affect the quality of the human environment” (Spensley, 1997: 404) . Many states have adopted this provision in similar state legislation so that state agencies must abide. It is believed that NEPA has been a significant environmental driver in public sector organizations by increasing sensitivity to the natural environment (Petulla, 1987: 103).

**2. Credibility Issues.** Both public and profit sector organizations have credibility issues to confront. Due to the nature of their business, public sector organizations



encounter different credibility issues than profit sector organizations (Walmsley and Zald, 1973: 6-7). Because public sector organizations receive their authority and funding from the public, the public demands accountability in return. Public sector organizations must be open to public inquiry because of this system of checks and balances prevalent in a democratic political system. In contrast, due to their market orientation, profit sector organizations react to credibility issues that arise through the market rather than directly from public scrutiny and open inquiry. If certain actions or policies cause the public to shy away from its products or services, then the organization will make changes to restore credibility and influence profits.

**3. Market Issues.** Profit sector organizations rely on the buying power of the public to gain competitive information for further economic resources in the form of revenue. The public sector lacks this clear direction, and attempts to work from an appropriation system that is independent of market input (Nutt and Backoff, 1992: 26). Basically, a political or oversight body appropriates the budget for a typical public sector organization with little or no market influence. The market influence can be an important driver for profit sector organizations to progress in the environmental continuum, but is not relevant as a driver for public sector organizations. If the market requires progression on the environmental continuum, then profit sector organizations comply to remain viable. Many profit sector organizations have realized this strength in the market and used progressive environmental approaches as a competitive advantage over their peers (Reinhardt and Vietor, 1996: 1-58, Coddington and Frankel, 1994: Chapter 15). Also, in relation to market influences, it is asserted that with the decrease of market influence on

an organization, there is less incentive for cost reduction and operating efficiency (Dahl and Lindblom, 1953; Savas, 1982: 24; Spann, 1977: 88).

**4. Financial Issues.** Financial issues for an organization stem from investors and insurers. Financial issues do not play a direct role in public sector organizations since the public sector does not seek investment or insurance from outside agents. In the profit sector, organizations rely heavily on investors and insurers to gain the capital they need for development. In the environmental realm, investors and insurers often make their investment or insurance decisions based, in part, on the environmental record of an organization (Barghava and Welford, 1996: 125-126). Pressure by investors and insurers makes financial issues an important driver for a profit sector organization to progress in the environmental continuum.

**5. Internal Issues.** Internal structures are also differentiated in public and profit sector organizations. "Key factors that distinguish public and private organizations are goals, authority limits, performance expectations, and types of incentives" (Nutt and Backoff, 1992: 44).

A key difference between public and profit sector organizations is the presence of organizational goals. Goals are often much more vague and conflicting in public sector organizations (Nutt and Backoff, 1992: 44). Consider the Department of Defense (DoD) as an example. In response to Congress' push for decreased defense spending, increased military readiness, and relief from increased operations tempo for military members, the DoD has proposed to close installations. This seems a rational proposal by many, but under close scrutiny, the public and Congress realize that this proposal will disrupt the

economies of those communities that face base closures. Basically, the overriding goals of Congress and the public are ambiguous and in direct conflict with those in the DoD. Profit organizations are concerned with these issues to a lesser degree, and quickly realize that they have to align goals with profit maximization to viably continue in their markets.

Administrators in the public sector do not share as much autonomy and flexibility as their profit sector counterparts (Banfield, 1975; Blumenthal, 1983: 28-31). Several factors play a role in this differentiation such as predominant checks and balances in the public sector as well as fragmentation and complexity of public sector organizations (Rainey, Backoff, and Levine, 1976). Consensus building is also more prevalent in public sector organizations which decreases authority and autonomy of administrators (Nutt and Backoff, 1992; 46).

Due to the ambiguity of goals in public sector organizations, performance expectations are more difficult to establish. Lacking clear performance expectations, public sector personnel often resolve to caution and risk avoidance in doing work, because mistakes are much more evident than success (Schultze, 1970: 162).

Theorists also propose that incentives for encouraging performance are much more difficult to establish in the public sector (Schultze, 1970). On a personal level, profit sector employees often find monetary incentives most preferable, while public sector employees relish intangible incentives such as job security, recognition, and more important tasks (Banfield, 1975: 596).

With relation to the environment, both public and profit sector organizations have internal structure and culture that play a part in progressing each organization in the

environmental continuum. Significant differences in both the structure and culture of these organizations affect how each independently progresses in that continuum.

#### **E. Conclusion**

There are many assertions as to how public and profit sector organizations differ. In the context of the research being performed in this particular investigation, it is hypothesized that in varying ways and degrees these differences, combined with the environmental drivers, play a key role in how public and profit sector organizations progress in the environmental continuum. Obviously, extensive research will be required to further investigate and substantiate this hypothesis, and this particular research is only an incremental part of that overall investigation.

Using the previous literature review information, the following table is presented to illustrate the relationship between the respective drivers and the two theoretical types of organizations. The table outlines how theoretically applicable the respective drivers are in progressing the particular organizations in the environmental continuum. Specifically, the table indicates internal, credibility, and regulatory drivers are applicable to public sector organizations in terms of environmental management. As the table indicates, internal, credibility, and regulatory drivers have a significant impact on the progression of public sector organizations in the environmental continuum. This research focuses on the significant structural drivers in Air Force environmental management as one particular segment of the public sector.

**Table 1. Environmental Continuum Drivers in Public and Profit Sector**

<b>Drivers</b>	<b>Public Sector</b>	<b>Profit Sector</b>
Regulatory	Applicable	Applicable
Credibility		
Consumers	Not Applicable	Applicable
Regulators	Applicable	Applicable
Public	Applicable	Applicable
Public Interest Groups	Applicable	Applicable
Market		
Industrial Consumers	Not Applicable	Applicable
Individual Consumers	Not Applicable	Applicable
Financial	Not Applicable	Applicable
Internal		
Structure	Applicable	Applicable
Culture	Applicable	Applicable

### **III. Synthesis**

#### **A. Introduction**

An environmental strategy model is an empirically driven classification system used to evaluate environmental management with relation to the previously discussed environmental continuum. A strategy performs the same function as the model, but it is conceptualized and lacks the needed operationalization and testing to be a model (Hass, 1996: 60). As previously discussed, many models and typologies exist, but they were developed with a major emphasis on classifying profit sector organizations. As part of this research, an appropriate conceptually based typology is composed to classify public sector organizations. Previous models and typologies are synthesized to compose this new typology, but peculiarities of profit sector organizations and public sector organizations are taken into account. The use of previous models and typologies allows a synthesis of several experts' views on typologies rather than relying on one particular view or set of criteria for classifying public sector organizations. The outcome is an environmental strategy typology that lays the foundation for analyzing public sector organizations and classifying them according to their commitment and actions toward the environment.

#### **B. Environmental Management Strategy Typology**

To select the appropriate models and typologies to be used in the synthesis for the new typology, certain criteria are established. The first criterion for selection is that the

proposed model or typology display environmental actions and commitment on a continuum. Another criterion for selecting an appropriate model or typology is that it display parameters that relate to public sector organizations and their drivers to progressing in the environmental continuum. While these models and typologies have parameters that are particular to profit sector organizations, overall, each entails parameters that account for public sector organizations. The last criterion for selecting an appropriate model or typology is that their parameters are specified across each stage or strategy in adequate detail to contribute significantly to the developed typology.

With the previous criteria in mind, the following existing models and typologies in Table 2 were used to develop the new model.

**Table 2. Strategy Models and Typologies Used For Synthesis**

Source	Continuum Stages				
Hunt & Auster (1990)	Beginner	Fire Fighter	Concerned Citizen	Pragmatist	Proactivist
Byrne & Kavanagh (1996)	Valley	Cliff	Plateau	Summit	
Roome (1992)	Non-Compliance	Compliance	Compliance Plus	Commercial and Environmental Excellence	Leading Edge
Ee (1997)	Economical Pursuance	Methodological Consideration	Total Production	Environmental Sustainment	Ecological Optimization
Gladwin, Kennelly, and Krause (1995)	Technocentrism	Sustaincentrism	Ecocentrism		
Colby (1989)	Frontier Economics	Environmental Protection	Resource Management	Eco-Development	Deep Ecology

By synthesizing the aforementioned models and typologies, an appropriate environmental strategy typology is developed for public sector organizations. The five developed strategies in the continuum include: Inactive, Reactively Compliant, Proactively Compliant, Preventive, and Assertive.

**1. Inactive.** Due to environmental legislation, most public sector organizations have either moved or been forced beyond the inactive stage. The inactive strategy encompasses qualities found in Colby's *frontier economics* paradigm, Hunt and Auster's *beginner* response, Byrne and Kavanagh's *valley* stage, and Gladwin, Kennelly, and Krause's *technocentrism* paradigm. The inactive organization does not take into account environmental concerns (Byrne and Kavanagh, 1996: 109-111). With regards to regulatory drivers, an inactive organization has little or no regulatory pressures on it. Organizations in the inactive stage of the continuum operate as if resources are infinite and meant for human consumption (Colby, 1989: 8-11). From a cultural perspective, personnel in the organization view their surroundings in an anthropocentric context (Colby, 1989: 7; Gladwin, Kennelly, and Krause, 1995: 883). Structurally, no environmental programs or goals are established at any level of the organization (Hunt and Auster, 1990: 9).

**2. Reactively Compliant.** The reactively compliant strategy displays characteristics of Roome's *compliance* stage and Hunt and Auster's *fire fighter* response. The reactively compliant organization reacts to environmental concerns only when legislative measures are forced upon them (Roome, 1992: 18; Hunt and Auster, 1990: 9). The organization also is unaware of its regulatory requirements in an environmental context



until indicated by an external agent. Structurally, the organization accepts a compliance objective only for environmental issues. There is a loose environmental management system in place in which funding is scarce. Culturally, the reactively compliant organization views environmental issues as the concerns of a particular department in the organization and individuals throughout the organization still have an anthropocentric mindset. The only credibility issue in a reactively compliant organization is that it does not want to be seen as out of compliance by regulators.

**3. Proactively Compliant.** As the name suggests, the proactively compliant organization seeks to proactively track and meet compliance. Unlike the reactively compliant organization, the proactively compliant organization actively monitors compliance and even incorporates pollution prevention measures if they enhance compliance. The proactively compliant organization exhibits qualities of Roome's *compliance* and *compliance plus* responses and Hunt and Auster's *concerned citizen* response. Structurally, a proactively compliant organization has a formal environmental management system that is based on a compliance objective (Roome, 1992: 18). Compliance is the #1 objective of the environmental program and may even be evident in the overall objectives of the organization, but corporate managers provide only a loose commitment to the objective (Hunt and Auster: 1996: 11). Funding is readily available when initiatives support the environmental compliance objective. The environmental management system is still placed in a separate department within the organization. Culturally, the organization is dominated by individuals with an anthropocentric mindset. Personnel do not feel as antagonistic towards the environmental management department

as in the reactively compliant strategy, but view it only as a tool to reduce the burdensome costs associated with environmental legislation. With regards to credibility, the main issue that the organization is concerned with is its reputation with environmental regulators. Public pressure is a concern, but the proactively compliant organization believes that the organization does its fair share by adhering to legislative guidelines. If faced with an environmental issue by the public, the organization defends itself by comparing its actions to legislative requirements. Going deeper in the regulatory realm, the proactively compliant organization is fully aware of its legislative requirements for the environment. Those within the environmental department begin to anticipate what legislation may affect the organization in the near future (one to three years).

**4. Preventive.** The preventive organization displays qualities of Ee's *total production* paradigm, Hunt and Auster's *pragmatist* and *proactivist* responses, and Byrne and Kavanagh's *plateau* stage. Structurally, the preventive organization has a well established environmental management system with active two-way interaction between other departments in the organization and themselves (Byrne and Kavanagh, 1996: 110; Hunt and Auster, 1990: 9). Compliance as a minimum is stressed with even more emphasis for having minimal impact on the environment in organizational processes (Hunt and Auster, 1990: 9). To accomplish this minimal impact, pollution prevention (P2) measures are actively sought (front-end versus end-of-pipe as in the proactively compliant strategy, and funding is readily available for "beyond compliance" measures of this type. Culturally, personnel in the preventive organization believe sustainability is an emerging issue for society. In action, though, the belief in sustainability does not alter

the actions of the individual or organization. For credibility, the preventive organization promotes itself as a good steward and advertises favorable environmental information. The organization's environmental information is readily available to regulators and the public (Byrne and Kavanagh, 1996: 110). The preventive organization also actively partners with the public and regulators to go beyond compliance. In the regulatory arena, the preventive organization goes beyond legislation. The preventive organization takes a long term outlook on future legislative actions (Ee, 1997: 63).

**5. Assertive.** The assertive strategy shares some of the characteristics found in Ee's *environmental sustainment* paradigm, Gladwin, Kennelly, and Krause's *sustaincentrism* paradigm, and Byrne and Kavanagh's *summit* stage. Structurally, the assertive organization has sustainable development in the corporate objectives. Environmental management is integrated into all departments of the organization and all personnel receive training in the environmental management system (Byrne and Kavanagh, 1996: 112). Culturally, the assertive organization has a sustaincentric mindset throughout (Gladwin, Kennelly, and Krause, 1995: 890). Sustainable development is vital to both the organization and its personnel (Ee, 1997: 63). For credibility, the assertive organization champions and advertises its sustainability efforts. There is active involvement with the community, regulators, and other organizations to seek and promote processes that are sustainable. Legislatively, the assertive organization transcends regulatory requirements and focuses on sustainability.

### **C. Analytical Procedure**

To effectively categorize public sector organizations with the newly developed strategy typology, an appropriate analytical instrument is necessary. The purpose of the analytical instrument is to outline the specific criteria associated with each strategy to allow a more standard measure of how to classify the organization according to what criteria the organization exhibits.

Using a similar method to that designed by Ee, the analytical instrument is developed (Ee, 1997: 62-63). The analytical instrument particular to this research couples the previously developed strategies with structural aspects of management systems in organizations.

The structural aspects in this research tie into the previously discussed ISO 14000 Environmental Management Standards. As found in ISO 14000, the specific components that comprise an environmental management system (EMS) are policy, planning, implementation and operation, checking and corrective action, and management review (Cascio, Woodside, and Mitchell, 1996: 39). Structural aspects of an organization included in these EMS components include policies, goals and objectives, funding, education and training, and management structure. Other environmental management system standards that include these structural aspects include the British Standards Institute's BS 7750, the Canadian Standards Association's CSA Z750, the Council of the European Communities' EEC no 1836/93, and the National Standards Authority of Ireland's IS 310 (Ee, 1997: 38-43).

With respect to environmental management, policy outlines the fundamental intentions and principles for the environmental performance of an organization (HQ AFCEE/EQP, 1998: 7). Objectives arise from the environmental policy and are established as a means to achieve an aspect of the policy. Goals arise from environmental objectives and aim to satisfy objectives. Goals are much more specific than objectives and are often quantifiable. Funding provides the necessary resources for environmental management in organizations. Education and training provide knowledge and skills for effectively accomplishing and carrying out environmental management roles and responsibilities in organizations. Management structure refers to how environmental management is structurally placed in the organization and to the documented roles and responsibilities of environmental management and its personnel.

The analytical instrument in Figure 2 synthesizes the previously discussed structural aspects with the developed typology for use in this research. In application, the researcher conducts interviews and analyzes documentation to classify environmental management involved in the case study for each appropriate structural aspect. Following the analysis, an appropriate environmental strategy is determined for each aspect. After each structural aspect is assigned to a strategy, an overall subjective assessment is used to categorize the organization to one overall environmental strategy. For example, the case may exhibit the following results:

Policies: Proactively Compliant  
Goals and Objectives: Proactively Compliant  
Funding: Reactively Compliant  
Training: Preventive  
Management Structure: Proactively Compliant

The overall environmental strategy assigned to this example would most likely be Proactively Compliant. Actual assignment of the environmental strategy would depend on the interview and documentation data used to make the aspect assignments. Discussions accompany the analysis of the data to substantiate the assignment of the environmental strategy.

<b>Structural Aspect</b>	<b>Inactive</b>	<b>Reactively Compliant</b>	<b>Proactively Compliant</b>	<b>Preventive</b>	<b>Assertive</b>
I. Policies	no environmental management (EM) policies at any level	shop level EM policies established with focus on compliance (usually in departments that have had compliance problems before)	EM policies established for all levels with focus on compliance	EM policies established at all levels with focus on minimal environmental impact with P2	EM policies focus on sustainable development
II. Goals and Objectives	no environmental management objectives or goals at any level	may have shop level EM objectives and goals established (usually in departments that have had compliance problems before)	compliance #1 objective of EM and goals support compliance	objectives and goals outline that compliance is minimum threshold (a push for going beyond compliance)	goals and objectives support sustainable development
III. Funding	no funding for environmental management initiatives	funding for EM initiatives are scarce and occurs when organization has regulatory pressure	Funding readily available if compliance is key objective	funding readily available for P2 measures	funding readily available to support sustainable development
IV. Training	no training on any aspect of environmental management	limited training for EM personnel	EM training available to managers outside of established EM organizational structure	EM training available throughout organization	EM training required throughout organization
V. Management Structure	no management structure in place for environmental management	EM in place, but organizational structure and job descriptions (personnel and department) not well defined	separate EM department with defined organizational structure and job descriptions	EM incorporates management at all levels (active two-way communication and involvement) with defined organizational structure and job descriptions	EM integrated into all departments and levels of the organization (no longer a separate department)

Figure 2. Environmental Continuum Analysis Instrument for Structural Driver

#### **IV. Methodology**

##### **A. Introduction**

To investigate the environmental strategies displayed in public sector organizations, an appropriate methodology is necessary. The two available classes of research techniques include qualitative and quantitative methods. As indicated previously in the literature review, there is a lack of research in the area of investigating environmental strategies in public sector organizations. This lack of previous research and the type of data gathered suggest a qualitative approach for this research. To further substantiate a qualitative approach, the qualitative characteristics shown in Table 3 are evaluated in the context of this research.

**Table 3. Characteristics of a Qualitative Research Problem (Morse, 1991: 120)**

The concept is "immature" due to a conspicuous lack of theory and previous research	Yes
A notion that the available theory may be inaccurate, inappropriate, incorrect, or biased	Yes
A need exists to explore and describe the phenomenon and to develop theory	Yes
The nature of the phenomenon may not be suited to quantitative measures	Yes

With an apparent qualitative approach appropriate to this research, a defined process, scope, and specific investigative tools are utilized for gathering data to analyze and answer the research questions.

## **B. Overview**

With the emphasis on profit sector organizations in developing previous environmental strategy models/typologies and the realization that public and profit sector organizations are differentiated, a new typology was developed to analyze public sector organizations. An analytical instrument was then constructed to evaluate public sector organizations with regards to structural aspects for progressing in the environmental continuum.

In further focusing this research on public sector organizations, Air Force environmental management served as a case study. Air Force documentation, from the headquarters level down to base level, was analyzed to investigate the environmental strategies displayed in the structural aspects of Air Force environmental management. The analysis of this documentation was linked to the analytical instrument to suggest an appropriate strategy in the developed typology. To further investigate and substantiate the strategy displayed in the overall case study, base level personnel were interviewed. Data from the base level personnel came from structured personal interviews by the researcher and further served to investigate the structural aspects of Air Force environmental management in the case study.

## **C. Case Study**

Case studies can be both explanatory or exploratory. Case studies that are explanatory often have research and investigative questions that focus on the “why” or “how” (Yin, 1994: 5-8). In this research, our case study was exploratory and focused on the “what” by



asking what environmental strategy was exhibited in Air Force environmental management (Yin, 1994: 7). To accomplish the objectives in this research, the single-case study utilized a primary unit of analysis and several methods for gathering evidence. By using a primary unit of analysis and multiple sources, a triangulation technique was accomplished. The triangulation technique is a way of using multiple sources of evidence to gain validity in the research (Yin, 1994: 90-94).

The organization of Air Force environmental management, as scoped in this research, was the primary unit of analysis. The main objective of the case study was to categorize what environmental strategy it exhibits. In investigating the organization in the case study, several sources of evidence were utilized. The sources included Air Force documentation as well as interviews of installation, Major Command, and HQ USAF personnel involved in the day-to-day operations of environmental management. At their respective management levels, the interviewed personnel were considered local experts in the environmental programs that they managed. This was accomplished to ensure valid information was gathered on Air Force environmental management. All sources were analyzed and linked to the analytical instrument to suggest an appropriate environmental strategy for the case study.

#### **D. Research Agenda**

As indicated in the Introduction chapter, one of the overriding investigative questions of this research is focused on what environmental management strategy is found in Air Force environmental management. A case study is accomplished to investigate this

question and the following investigative questions are established to analyze the structural aspects of Air Force environmental management:

1. What environmental management strategy do Air Force policies reflect?
2. What environmental management strategy do Air Force objectives and goals reflect?
3. What environmental management strategy does Air Force training reflect?
4. What environmental management strategy does Air Force funding reflect?
5. What environmental management strategy does the management structure of Air Force environmental management reflect?

As part of the case study, these investigative objectives helped answer the overriding investigative question of what environmental management strategy was exhibited in Air Force environmental management structure. To answer each investigative objective, certain sources of data were sought. The following paragraphs outline the sources of data that were utilized to answer the investigative objectives for the case study.

**1. Questions #1 and #2.** To investigate what environmental management strategy Air Force policies, objectives, and goals reflect in the case study, documented material were examined. Air Force policies are reflected in directives, Air Force Instructions (AFIs), and official memorandums. Published organizational objectives and goals were also examined. Organizational objectives, goals, directives, and memorandums are present at the HQ USAF, Major Command, and installation levels. Air Force Instructions are available at the HQ USAF level. Supplements to the AFIs were sought after at the Major Command and installation levels. Further substantiation of findings or

clarification on documented material was accomplished through interviews at the appropriate levels.

**2. Question #3.** To investigate what environmental management strategy was exhibited by the education and training program in the case study, documentation as well as interviews were utilized. The documentation used included published policies, organizational requirements for environmental management education and training, and funding availability. Interviews were used with key environmental management personnel at each respective level to investigate what the norms were regarding environmental management education and training (e.g. who gets it, what is available, what funding is available). Documentation was sought at the HQ USAF, Major Command, and installation levels.

**3. Question #4.** In investigating what environmental management strategy that funding in Air Force environmental management supports, documentation as well as interviews were utilized. The documentation included policies that outline criteria to allocate and prioritize funding for environmental projects and programs. Other documents included staff presentations/briefs that outlined existing and projected funding for Air Force environmental programs. Since funding priorities have been dynamic over the past decade in the Air Force, interviews focused on reinforcing present guidelines and future projections for environmental funding. Both documentation and interviews were focused at the HQ USAF and Major Command levels, since it is at these levels where funding allocations are programmed and guidelines established. Interviews for

environmental funding were also accomplished at the installation level to gain the perspective of environmental flight personnel.

**4. Question #5.** To investigate the environmental strategy exhibited by the management structure of Air Force environmental management under the case study, documentation and interviews were used. Documentation included AFIs and organizational charts characterizing how environmental management is structured and placed in the overall corporate structure at each of the three levels being analyzed (HQ USAF, Major Command, and installation levels). Interviews were used to further substantiate the documentation as well as gain an insight on how effective communication lines are for environmental management and the overall corporate structure.

#### **E. Constraints**

There are certain constraints found in this research that require discussion. The first evident constraint of this research involves using interviews as a research tool to gain evidence. As indicated in Appendix B, in an effort to accommodate the busy schedules of the interviewees and to generate genuine responses, interviewees were given the option of accomplishing the interviews by telephone or electronic mail. Time and funding did not allow interviews to be accomplished in person. As a by-product of the interviews being accomplished over the telephone or electronic mail, mostly with respect to electronic mail, clarification of questions and responses was often required. In retrospect,

those who did take part in the research were genuine in their responses and appropriate findings and conclusions were accomplished.

A second limitation of this research pertains to the number of installations that took part in the investigation. Due to time constraints, only one Major Command could be investigated for the case study. ACC was chosen in large part because of the ease of accessibility to information and it has installations throughout the Continental United States (CONUS). Because of time constraints, only four of the over twenty Continental United States installations within ACC were investigated in this research and in no way does this case study encompass all the ACC installations. Due to uniformity of the environmental programs at the four investigated installations, the findings do show indications of what may be found at the other installations that were not investigated. In a broader sense, the other Major Commands may operate environmental management differently. Even having investigated the structural aspects at the HQ USAF level, applying the findings and conclusions beyond ACC are ill advised.

A third limitation of this study also pertains to the time constraints involved with this research. The developed environmental strategy typology and analytical instrument did prove adequate to be used in this case study investigation. To develop the typology into an accepted model, will require further testing and application on public sector organizations. Appropriate instruments will also have to be developed and utilized to test and apply the typology.

The last constraint pertains to the case study approach used in this research methodology. An important aspect to note is that the case study strategy utilized in this

research is bounded in time and setting. The timeframe encompasses what is currently happening in environmental management and the setting pertains to the Air Force and specifically, ACC and four ACC installations. In using the case study strategy, the findings of this research are not intended to be broad and inclusive of all public sector organizations. The findings are intended to explore strategies and provide evidence for further research of environmental management in public sector organizations.

## **V. Case Study Findings**

### **A. Overview**

This chapter outlines the findings used to identify the environmental management strategy associated with the case study. Each investigative question for the case study is addressed independently and findings at each appropriate level of management are indicated. The pertinent documentation used to answer the case study's investigative questions as well as a listing of personnel interviewed is outlined in Appendix B. The guided interview questions for the respective interviewees are outlined in Appendix A.

### **B. Investigative Question #1 Findings**

Question #1 addresses what environmental management strategy was exhibited in Air Force policy as reflected in the case study. Appendix B outlines the documented material examined to answer the investigative question as well as the personnel interviewed to substantiate findings in the documented material. The following paragraphs reveal the findings at each appropriate level within Air Force environmental management under the case study.

**1. HQ USAF Level.** As the lead policy document in the Air Force for environmental management, AAFP 32-70, *Environmental Quality*, lays the foundation for the environmental management program in the Air Force. As reflected in AAFP 32-70, the Air Force broadly lays out and establishes an environmental quality program based on the "four pillars." The four pillars consist of Cleanup, Compliance, Conservation, and

Pollution Prevention (P2) and their definitions are included in Appendix C as defined in the policy directive. The policy directive indicates that, at a minimum, a compliance policy is in place for Air Force environmental management. In support of this compliance at a minimum policy, AFPD 32-70 commits the Air Force to “conduct its activities according to national environmental policy. Commanders at all levels are responsible for full compliance with national and Air Force environmental policy” (DAF, 1994(c): paragraph 2). Further support for the minimum of compliance policy is indicated when AFPD outlines that the “Air Force will seek sufficient funding to carry out all environmental activities needed to meet its legal obligations” (DAF, 1994(c): paragraph 4). When reviewing Attachment 3 of AFPD 32-70, the four pillars are established to implement current federal statutes, Executive Orders, and DoD directives.

To investigate if a move beyond compliance is entailed in Air Force environmental management policy, each pillar is further examined in light of how it is defined in AFPD 32-70. Though the P2 and Conservation pillars are closely tied to legislative drivers such as the Montreal Protocol of Substances That Deplete the Ozone Layer and the National Environmental Policy Act of 1969, their definitions are broad enough to encompass aspects that hint at moving beyond compliance of these legislative drivers. The P2 pillar promotes prevention of “releases of pollutants into the environment” and reducing use of hazardous materials through substitution and process change (DAF, 1994(c): paragraph 3.4). The Conservation pillar promotes conservation of natural and cultural resources as well as consideration of environmental consequences of proposed actions (DAF, 1994(c): paragraph 3.3).



**a. Pollution Prevention.** Moving beyond the AFPD 32-70 policy document that was written in 1994, DoD Instruction 4715.4, *Pollution Prevention*, as written in 1996, requires all service components within the DoD to comply with its instructions (DoD, 1996(b): paragraph 5.6.1). The overriding subject of this instruction is pollution prevention in the DoD. In relation to time and in the context of Air Force environmental management policy, this instruction is the first place where emphasis is directed toward a management approach of using pollution prevention as the “‘first choice’ in achieving compliance with applicable environmental requirements and Executive Orders” (DoD, 1996(b): paragraph 4.2.1). This management approach, as succinctly expressed in recent Air Force funding guidance, is termed “compliance through pollution prevention.” Also as part of DODI 4715.4, separate Environmental Quality (EQ) Classes are established that classify varying pollution prevention activities. Definitions of the EQ Classes as they pertain to P2 are outlined in Appendix D. In context of the environmental continuum, the most proactive designator is Class III which identifies activities that are not “explicitly required by law but are needed to address overall environmental goals and objectives” (DoD, 1996(b): paragraph E3.1.9.4). How far activities can go beyond compliance depends on how proactive the environmental goals and objectives are established. EQ Classes 0, I, and II, however, are tied directly to compliance.

Air Force environmental management has implemented a P2 program through the release of AFI 32-7080, *Pollution Prevention Program*, 12 May 1994. AFI 32-7080 provides policy and guidance on ozone depleting chemicals, Environmental Protection Agency 17 Industrial Toxics, hazardous waste minimization, municipal solid waste

management, and energy conservation for Air Force environmental management. With the 12 September 1997 memorandum on Pollution Prevention Funding Guidance, Air Force environmental management has tied the DoD EQ Classes into the Air Force P2 program. This is a change from the original P2 Levels referenced by Air Force environmental management in AFI 32-7080 (and included in Appendix E) for classifying varying P2 activities. As Figure 3 depicts, Air Force environmental management has technically shifted from the AFI 32-7080 P2 Levels to DoD EQ Classes.

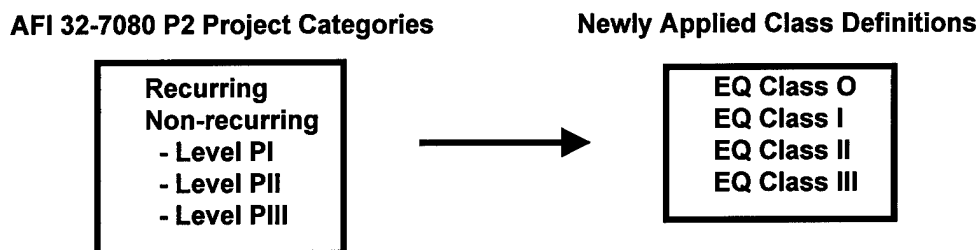


Figure 3. Transition From Project Categories to EQ Class Definitions in P2

More fundamental to the transition to EQ Classes in P2 is the overall shift of P2 strategy emphasized in the 12 September 1997 memorandum. Air Force environmental management is now echoing the strategy encompassed in DODI 4715.4 where "P2 is the preferred approach for compliance" at all levels in Air Force environmental management (HQ USAF/ILEV, 1997). Strengthening this strategy is the fact that P2 as a preferred approach for compliance is included in the definition of an EQ Class I activity. As in the previous P2 Levels, proposed P2 initiatives must be cost effective in combating rising compliance costs. The measure for this cost effectiveness is the payback of the proposed

P2 initiative compared to traditional end-of-pipe compliance measures (DoD, 1996(b): paragraph E3.1.9.2).

In the near future, Air Force environmental management plans on strengthening its commitment to a strategy of “compliance through P2” (CTP2) by revising the AFI 32-7080 policy document for P2. The proposed title of the revised AFI 32-7080 is *Compliance Assurance and Pollution Prevention* and is currently in draft form with comments being solicited from all bases and Major Commands in the Air Force. Implementation of the revised AFI 32-7080 is expected in the Spring of 1999 (Wood, 1998). In the draft copy of the revised AFI 32-7080, achieving and maintaining full compliance with all federal, state, and local requirements is still emphasized (DAF 1998(a): paragraph 1.2.1). As part of the CTP2 process, Air Force environmental management will “proactively identify and address potential compliance vulnerabilities” by preferring to “apply P2 solutions that achieve compliance.” Cost effectiveness of proposed P2 initiatives to combat compliance requirements is still emphasized (DAF, 1998(a): paragraph 1.2.3).

**b. Conservation.** Moving beyond AFPD 32-70, *Environmental Quality*, one of the lead policy documents for the Conservation pillar in Air Force environmental management is AFI 32-7064, *Integrated Natural Resources Management*. AFI 32-7064 “addresses the management of natural resources on AF properties to comply with federal, state, and local standards” (DAF, 1997: paragraph 1.1). This appears to echo a compliance strategy found in other policy documents for Air Force environmental management. Just as found in the P2 policy documents, AFI 32-7064 classifies

conservation initiatives based on the DoD EQ Classes. DoD EQ Classes with relation to conservation programs are included in Appendix F as taken from DODI 4715.3, *Environmental Conservation Program*. As in P2 policy documents, EQ Classes 0, I, and II for conservation programs are tied to compliance of federal, state, and local requirements. EQ Class III identifies initiatives that go beyond compliance of these external requirements.

A more progressive environmental management aspect of AFI 32-7064 includes biodiversity conservation. Under biodiversity conservation, the Air Force strives to maintain ecosystem diversity on Air Force controlled lands and waters “when consistent with mission and practical.” Air Force environmental management believes that failing to maintain ecosystem integrity and sustainability could negatively impact continued Air Force access to land. This negative impact would also negatively impact the Air Force mission (DAF, 1997: paragraph 2.2). With the previous features of biodiversity conservation in AFI 32-7064, Air Force environmental management policy hints at aspects of sustainable development. After delving further in AFI 32-7064, though, the only particular actions outlined for biodiversity conservation, such as wetland conservation, stem directly from legal requirements.

## **2. HQ ACC Level.**

**a. Documentation.** At Air Combat Command (ACC), the *Environmental Quality Handbook* is considered a policy document at the Major Command level. “Its intent is to provide policies and directives to enable each ACC installation the opportunity to fully

comply with the spirit and intent of AFPD 32-70 and the law”(HQ ACC/CEVQ, 1997: 1-1). It is not intended to supersede any policy guidance beyond or above ACC.

The focus of the *Environmental Quality Handbook* is on the P2 and Compliance pillars of AFPD 32-70 (HQ ACC/CEVQ, 1997: 1-1). There is no significant difference in policy guidance between the *Environmental Quality Handbook* and HQ USAF level guidance for the P2 and Compliance pillars. The emphasis is placed on compliance of external requirements. As an example of this emphasis on compliance, the introduction iterates:

The Command environmental programs division is committed to doing everything within its resources to ensure the wing commanders have every possible tool at their disposal to ensure the wing, the Command, and the Air Force’s full environmental compliance while simultaneously sustaining the Air Combat Command Fly and Fight Mission. (HQ ACC/CEVQ, 1997: 1-1)

A notable step forward beyond compliance requirements is that ACC has established P2 goals beyond the Air Force’s P2 goals in the *Environmental Quality Handbook*. These proactive goals for ACC are established in the P2 program components of hazardous waste reduction, ozone depleting substances, solid waste reduction, and solid waste recycling (HQ ACC/CEVQ, 1997: 15-2). The specific ACC and Air Force P2 goals are included for reference in Appendix G.

**b. Interviews.** To gain a better understanding of policy guidance in ACC for environmental management, interviews were accomplished as indicated in Appendix B. The interviews revealed an emphasis on external Federal, State, and local compliance requirements for environmental management in ACC as well as compliance with HQ USAF established policy guidance (Wood, 1998; Barker, 1998). In particular, ACC

seems to be leading the way with the compliance through P2 strategy. For example, as part of the proposed revision for AFI 32-7080, ACC is already implementing some of the initiatives identified in the new version. ACC is currently in the process of identifying and prioritizing their compliance sites (Wood, 1998). Compliance sites are facilities or processes under Air Force control that are subject to local, state, or federal environmental regulations (DAF, 1998(a): 35). With these compliance sites identified, an evaluation method is used to help identify the risk associated with the sites in ACC. The evaluation method is known as the Operational Risk Management (ORM) process for hazard risk assessment (DAF, 1998(a): 41). The process uses a hazard risk assessment matrix to establish hazard categories for the identified compliance sites. The hazard categories are outlined in Appendix H for reference. After identifying the compliance sites within the command, ACC then plans on evaluating the top 5% of their most hazardous sites for possible CTP2 solutions (Wood, 1998).

Hazard risk assessment is not only being used in the CTP2 arena. Due to funding shortfalls, Conservation requirements that stem directly from compliance with Federal, State, and local requirements are not being fulfilled. With this shortfall "ACC uses risk management procedures to identify needs with the greatest mission impacts" and funds them accordingly (Barker, 1998).

Even though AF policy is to make programs "compliance driven" in environmental management, many programs and projects within ACC go beyond compliance (Wood, 1998; Barker, 1998). In the Conservation realm, special funding authorities such as the Legacy Resource Management Program are established to take a proactive approach to

conservation. Projects under Legacy are “designed to enhance the identification, treatment and preservation of sensitive natural and cultural resources on military lands” (Barker, 1998). Though many of the Legacy projects alleviate compliance requirements, they are not intended to be directly tied to compliance requirements (Barker, 1998).

In the P2 realm at ACC, projects that go beyond compliance requirements are still accomplished. A project not tied to compliance requirements in ACC includes HAZMARTS. HAZMARTS are facilities that centrally stock, store, issue, and distribute hazardous substances on an Air Force installation. Even though HAZMARTS were developed due to hazardous materials accountability requirements under the Emergency Planning Community Right-to-Know Act (EPCRA), they go well beyond legal requirements (Wood, 1998). HAZMARTS are intended to increase resource efficiency in accounting for hazardous substances, while decreasing compliance liability under EPCRA at ACC installations. As a further benefit, the implementation of HAZMARTS in accounting for hazardous substances allows for standardization across ACC.

**3. Installation Level.** Interviews revealed that adherence to HQ USAF and ACC level policy guidance is the norm. No significant policy guidance is formulated at the base level, with the exception of standard operating procedures for processes such as hazardous waste handling and disposal, recycling, etc. With regards to the four pillars of environmental quality, compliance with Federal, State, and local requirements is the main emphasis at the interviewed installations (Abrams, 1998; Dixon 1998; Miller, 1998; Poland, 1998). The interviewed flight chiefs are aware of the CTP2 strategy in Air Force environmental management. A deeper discussion of the CTP2 strategy implications is

discussed in investigative question #4 for funding in Air Force environmental management at the installation level.

### **C. Investigative Question #2 Findings**

Question #2 addresses what environmental management strategy was exhibited by the goals and objectives established within Air Force environmental management as reflected in the case study. For clarification in this case study, goals have a narrower focus and aim to satisfy broader objectives. Objectives have a narrower focus than mission statements but are intended to support and implement mission statements.

Appendix B outlines the documented material examined and personnel interviewed to answer investigative question #2. The following paragraphs reveal the findings at each appropriate level within Air Force environmental management under the case study.

**1. HQ USAF Level.** To support the overall mission of the United States Air Force, Air Force environmental management has developed Environmental Program Principles. The Environmental Program Principles are considered as mission statement equivalents for environmental management at the HQ USAF level. The Principles include Sustain Readiness, Be a Good Neighbor, and Make Smart Business Decisions and Bring Technology to Bear (Yaktus, 1998(a); Widnall and Fogleman, 1995). As later seen at the HQ ACC level, it is customary for a department within an organization to have goals and objectives for the department as a whole to carry out its mission statement. Current objectives and goals for HQ USAF/ILE do not exist, but rather there are currently program objectives and goals for the four respective pillars. As previously stated, Air



Force environmental management has established the four pillars to accomplish its environmental quality program. Air Force environmental management also relies on the four pillars to carry out the Environmental Program Principles. The four pillars of Cleanup, Compliance, Conservation, and P2 have specific mission statements for each.

The Cleanup mission statement is to “identify, investigate, and clean up contamination associated with past Air Force activities” (HQ USAF/CEVR, 1996: 2; Yaktus, 1998(a)). In the Compliance pillar, the mission statement is “Ensure our present operations comply with all federal, state, and local environmental standards” (Yaktus, 1998(a)). The Conservation mission statement is “Conserve and manage our natural and cultural resources, including wetlands, endangered species, and historic sites to enhance operational readiness” (Pitchford, 1998). For the P2 pillar, the mission statement is “Prevent future pollution by reducing hazardous material use and releases of pollutants into the environment to as near zero as feasible” (Yaktus, 1998(b)). Specific objectives and goals pertinent to each pillar’s mission statement are located in Appendix M.

**2. HQ ACC Level.** Environmental Management at ACC realizes that the threefold responsibilities that they have are to “sustain readiness, to be good neighbors and to be responsible stewards of the lands entrusted to ACC” (Patrick, 1998(b)). These responsibilities coincide with the Environmental Program Principles found in environmental management at the HQ USAF level. Accomplishing these responsibilities are viewed as integral to supporting the overall ACC mission of “rapid, sustainable and decisive airpower delivered anytime, anywhere” (Patrick, 1998(b)). More specific than the broad responsibilities, environmental management at ACC has issued a Business Plan

that outlines activities to support the ACC mission. Unlike HQ USAF level environmental management, this Business Plan outlines the mission statement, objectives, and goals of environmental management at ACC as a whole. Environmental management at ACC also abides by the same mission statements and objectives for the four pillars previously found at the HQ USAF level. With respect to the goals for the four pillars, ACC either holds the same or makes more stringent goals to support the environmental objectives found at the HQ USAF level.

The Environmental Mission Statement for environmental management at ACC is “Civil Engineering’s quality professionals providing environmental excellence to the Civil Engineer directorate and field units anytime, anywhere” (Patrick, 1998(b)). To support the mission statement, ACC environmental management developed objectives and goals, with ACC labeling the goals as “Focus Areas.” Appendix M outlines the objectives and goals for the HQ ACC Environmental Division as a whole rather than for individual pillars. Table 4 outlines the focus of each individual objective and its respective goals:

**Table 4. Emphasis of Respective HQ ACC/CEV Business Plan Objectives and Goals**

<b>Objective</b>	<b>Focus Area</b>	<b>Emphasis</b>
1	1.1 - 1.4	Internal Operations
2	2.1 - 2.4	Internal Operations
2	2.5	Compliance
3	3.1, 3.10 - 3.12	Internal Operations
3	3.2 - 3.9	Compliance
4	4.1 - 4.5, 4.10 - 4.11	Internal Operations
4	4.6 - 4.9, 4.12 - 4.13	Compliance

Many of the objectives and goals are oriented toward internal operations such as accomplishing funding percentages by certain dates, tracking compliance assessments, or providing and tracking customer service. The remaining objectives and goals are oriented toward compliance issues such as preventing regulatory enforcement actions with regards to underground storage tanks or PCBs. In the area of P2 and Conservation, the objectives and goals are oriented toward satisfaction of Executive Orders as well as Federal, State, and local laws.

**3. Installation Level.** The interviewed Flight Chiefs expressed that the established HQ ACC/CEV Business Plan Objectives and Focus Areas are also in effect for their flights (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). This coincides with HQ ACC/CE's request that the HQ ACC/CE Strategic Plan (with Business Plan included) be embraced by all Civil Engineer Squadrons throughout ACC (Robbins, 1998). A large amount of emphasis in following the HQ ACC/CEV Business Plan is placed on the Environmental Status of Resources and Training Systems (ESORTS) (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). ESORTS is a rating system composed of two criteria that enable Installation Commanders to assess their environmental management programs. The Environmental Flights are responsible for compiling the necessary information for the ESORTS. Under the two ratings, each individual pillar is given a rating on a scale of E-1 to E-4, with (E-1) being No Problems and (E-4) being Program Failure. With these individual criteria ratings for each pillar, the Commander then gives a subjective and justified rating for the environmental management program as a whole

(Miller, 1998). An example criteria rating sheet for each pillar and an overall rating sheet is given in Appendix N for further reference.

#### **D. Investigative Question #3 Findings**

Question #3 addresses what environmental management strategy was exhibited in the training program as reflected in the case study. Appendix B outlines the documented material examined as well as the personnel interviewed to answer the investigative question. The following paragraphs reveal the findings at each appropriate level within Air Force environmental management under the case study.

**1. HQ USAF Level.** To guide environmental education and training, Air Force environmental management had used the Air Force Environmental Education and Training Guide. At the end of 1998, the Air Force Environmental Education and Training Guide was dissolved and partially absorbed into AFI 32-7087, *Environmental Education, Training, and Career Development* that is currently being developed (Tennison, 1998(a)). Even though AFI 32-7087 is not expected to be finally implemented until April 1999, the environmental education and training process that is currently being adhered to is incorporated in the draft version of AFI 32-7087, referenced in this research (Tennison, 1998(b)).

Due to shrinking budgets, AFI 32-7087 was developed to conduct environmental education and training smarter and more cost effective than under guidance of the Air Force Environmental Education and Training Guide (Tennison, 1998(a)). AFI 32-7087 “provides guidance for establishing, implementing and managing Air Force

environmental education and training programs” (DAF, 1998(b): 1). The environmental education and training process implemented by AFI 32-7087 is intended to ensure that environmental professionals at all levels in environmental management receive appropriate training. The implemented process is intended to help personnel determine and prioritize valid requirements as well as justify resources for these environmental education and training requirements (DAF, 1998(b): paragraph 4.0).

Specific responsibilities are outlined in AFI 32-7087 for implementing and managing the environmental education and training process. Responsibilities are placed at all levels of Air Force environmental management. Responsibilities include developing policy guidance at the HQ USAF level; planning, programming, and budgeting requirements at the Major Command level; and determining education and training requirements at the installation level.

Primarily, environmental education and training are accomplished through the Air Force Institute for Technology Civil Engineering and Services School in Wright-Patterson AFB, Ohio, the United States Air Force School of Aerospace Medicine in Brooks AFB, Texas, or through commercially contracted institutes by approval of HQ USAF/ILEV (DAF, 1998(b): paragraph 4.4). To help identify specific training requirements available to personnel, an environmental education and training data base has been established at HQ AFCEE. This data base is accessible on the World Wide Web for personnel to identify training requirements they require for the duties they hold in Air Force environmental management (Tennison, 1998(a); DAF, 1998(b): paragraph 3.4.9).

As previously mentioned, AFI 32-7087 was implemented to help conduct the environmental education and training process smarter and more cost effective. To aid this, AFI 32-7087 has implemented a prioritization process for identifying training requirements (Tennison, 1998(a)). The prioritization process uses a table that "ties training classification to the probability of increased risk or vulnerability to regulatory enforcement" (DAF, 1998(b): paragraph 4.2). The specific table with appropriate categories is included in Appendix I.

Moving beyond the recent AFI 32-7087, Air Force environmental management has felt that "historically, there has been a lot of 'over-training'" in environmental education and training (Tennison, 1998(a)). The most important objective of Air Force environmental management in environmental education and training is to ensure that personnel "have the right tools and training to do their jobs in an environmentally responsible way and to achieve AF environmental goals, but to do so using a common-sense, cost-conscious approach" (Tennison, 1998(a)). To accomplish this objective, not all environmental education and training requirements are just tied to direct compliance drivers. Many of the environmental education and training requirements are established for personnel to adequately manage environmental programs. As an example, there is no compliance requirement for personnel to be trained in Clean Air Act requirements, but it is evident that training is necessary for Air Program Managers to execute their programs with efficiency and in compliance (Tennison, 1998(a)). As AFI 32-7087 and the risk assessment model for environmental education and training in Appendix I indicates, though, training is tied to personnel who have direct environmental duties that have a

mission impact (DAF, 1998(b): paragraphs 3.1.3, 3.14.2, and 4.2). In reality, compliance requirements often have a direct mission impact if not properly accounted for or accomplished.

**2. HQ ACC Level.** As identified in the March 1998 Environmental Leadership Council Minutes, ACC sponsors a yearly Environmental Training Symposium. The Symposium provides training for environmental personnel throughout the Command as well as other attending Commands, such as Air Mobility Command and Air Education and Training Command (HQ ACC/CEVO, 1998).

**3. Installation Level.** At the interviewed installations, environmental education and training is accomplished for personnel within and outside the environmental flight. Also, environmental flight personnel both receive and provide environmental education and training. Lastly, the environmental education and training that is accomplished is not just directly tied to compliance requirements.

Beginning with the environmental flight personnel, environmental management training for these personnel is readily available. Coinciding with the objectives for environmental education and training entailed in AFI 32-7087, flight personnel receive the appropriate training for the programs that they manage (DAF, 1998(b): paragraph 2.0; Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). Examples of training for flight personnel include P2 Program Manager training, Air Program Manager training, and Environmental Compliance Assessment and Management Program (ECAMP) training. Training programs for personnel in the environmental flight are predominately

accomplished at the Air Force Institute of Technology Civil Engineering and Services School.

Environmental education and training outside of the environmental flight is predominately tied to compliance requirements and often requires certification procedures. A prime example of training tied to compliance requirements that requires certification involves shop level personnel who handle, store, or dispose of hazardous wastes. Through the cooperation of using-organizations at the installation, the environmental flight identifies the personnel at the shop level that require appropriate compliance related environmental education and training. Funding for the environmental education and training is provided by the environmental flight and usually accomplished through commercially contracted institutes by coordination of the environmental flight (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

There is environmental education and training for personnel outside of the environmental flight and not directly tied to compliance requirements. The personnel who receive this training are base leadership, base populace, and local communities.

With regards to base leadership personnel, such as the group and wing commanders or Environmental Leadership Council members, several of the interviewed installations provided awareness level training oriented to their particular bases (Dixon, 1998; Miller, 1998; Poland, 1998). It was also indicated that awareness level training is provided at ACC through a Commander's Environmental Training course at the annual ACC Environmental Symposium. The course provides a broad overview of environmental



policy and regulations as well as the ECAMP process within ACC (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

For the base populace and environmental education and training not directly tied to compliance requirements, awareness level training is provided. The interviewed installations provide awareness level training for recycling and hazardous waste disposal for personnel during newcomer's briefings or through literature handed out during in-briefings for new base housing occupants (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). Installations also accomplish awareness level training by publishing articles in the base paper. Base papers cover such special interest items as disclosing cultural and natural resources on the installations, recycling, energy conservation, pesticide use, battery and used oil disposal, and solid waste reduction (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). One installation even published "crossfeed" articles for the work-place to cover organization specific topics such as the benefits of recycling cardboard and paper, proper disposal of used oil rags and industrial wastes in the work environment (Dixon, 1998).

Ending with personnel outside of the base populace, the interviewed installations also provide environmental education and training not directly tied to compliance requirements. Due to their expertise, there are often requests for personnel within the environmental flight to go to local schools and teach about the respective environmental programs that affect the local community. A prime example from the interviews involves environmental flight personnel instructing about the cultural and natural resources that exist at both the base and local community (Abrams, 1998; Dixon, 1998).

#### **E. Investigative Question #4 Findings**

Question #4 addresses what environmental management strategy was supported by funding in Air Force environmental management under the case study. Appendix B outlines the documented material examined as well as the personnel interviewed to answer the investigative question. The following paragraphs reveal the findings at each appropriate level within Air Force environmental management under the case study.

**1. HQ USAF Level.** Funding for Air Force environmental management is accomplished in the Biennial Planning, Programming, and Budgeting System (BPPBS). As a general overview, the BPPBS is actually an annual cycle that first matches Air Force programs to requirements for a two fiscal year increment. After programs are identified, then available resources are matched to the programs (D'Angelo, 1998: 15). The DoD annual BPPBS cycle provides funding for environmental programs, and Air Force environmental management represents just a small portion of the budget in the overall DoD budget. With a general overview of the BPPBS cycle, there are two specific aspects of environmental funding that will be covered in this section. The first aspect covered is environmental funding policy that guides what resource programs are available to Air Force environmental management. The other aspect covered is the actual budget expenditures in Air Force environmental management.

**a. Policy Guidance.** Environmental funding policy is predominately developed at the HQ USAF Level. HQ USAF Level funding policy provides guidance for the Major Commands and installations (Yaktus, 1998(a)). The guiding policy document for environmental funding issues in Air Force environmental management is AFI 32-7001,

*Environmental Budgeting.* AFI 32-7001 “provides guidance on identifying, developing, and processing requirements to meet environmental standards at all Air Force installations” (DAF, 1994(a): 1). AFI 32-7001 outlines the pertinent budget elements for each pillar in the Air Force environmental quality program. Subtle modifications to these budget elements have been brought about by further policy guidance in official memorandums and AFIs. Specifically, as previously mentioned in investigative question #1, further policy guidance at the HQ USAF level has adopted the DoD EQ Class definitions and applied them to programs and initiatives in the pollution prevention, compliance, and conservation pillars.

Moving beyond the environmental budget elements in funding policy, Air Force environmental management has provided other significant funding guidance. Currently, funding guidance under the DoD Defense Planning Guidance dictates that only DoD EQ Class 0 and I requirements be funded (Yaktus, 1998(a); HQ USAF/IL, 1998; HQ USAF/ILE, 1997(a)). HQ USAF/ILE has made Major Commands and installations aware of this guidance and asked that only Class 0 and I requirements be submitted for budget submittals to be used in the BPPBS (Yaktus, 1998(a)). Only funding Class 0 and I requirements is significant in that it focuses efforts of Air Force environmental management on just near term Federal, State, and local compliance requirements.

Air Force environmental management has also supported the previously discussed CTP2 strategy in funding guidance (HQ USAF/ILE, 1997(a); Negri, 1998; Yaktus, 1998(a)). Air Force environmental management believes using P2 solutions for Class I requirements will keep costly compliance requirements from recurring (Yaktus, 1998(a)).

With environmental funding policy guidance provided to the Major Commands and installations from the HQ USAF level, budget submissions are accomplished. The following section discloses information pertinent to actual budget development and expenditures in Air Force environmental management.

**b. Environmental Budget.** After gaining inputs from the Major Commands, HQ USAF compiles the actual Air Force environmental budget requirements and submits it to Congress. As a public sector organization, the Air Force must justify the established environmental budget requirements to Congressional leadership. This interaction is accomplished at the HQ USAF level, also. As previously mentioned, due to recent and projected future budget constraints in the DoD, HQ USAF has given guidance to Air Force environmental management that only EQ Class 0 and I requirements will be funded. Air Force environmental management is abiding by this in current and future budget submittals. Figure 4 outlines the past, current, and future budget estimate submissions for environmental funding in each of the environmental quality pillars.

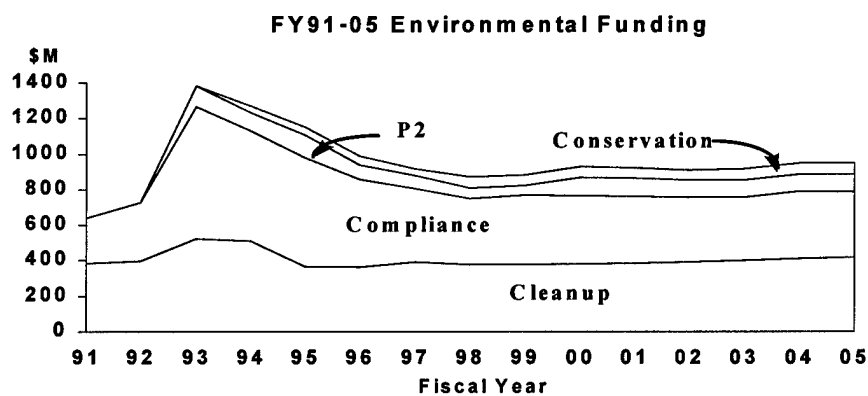


Figure 4. Environmental Funding as Seen in Budget Estimate Submittal, FY 00/01 Cycle (Yaktus, 1998(b))

Specific budgetary values for each pillar and fiscal year are presented in Appendix J. The figure for environmental funding was extracted from a slide used to defend the fiscal year 2000 and 2001 budget estimate submittal for environmental management. As seen in the figure, the majority of the environmental budget is centered on the Cleanup and Compliance pillars.

Also, there needs to be further explanation for the CTP2 strategy in future environmental funding. As previously mentioned, Air Force environmental management is adopting the CTP2 strategy. To commit to this strategy in the funding arena, HQ USAF level environmental management has challenged Major Commands and installations to increase P2 funding requirements by 20 percent with a decreasing 20 percent decrease in compliance requirements by fiscal year 2003 (HQ USAF/ILE, 1997(b)). To back this commitment, Air Force environmental management has actually programmed a 20 percent shift of environmental funds from the Compliance pillar to the P2 pillar in fiscal year 2000. This shift is accounted for in the previous figure on environmental funding and causes an almost doubling of available P2 funds for fiscal year 2000 and beyond (Yaktus, 1998(b)). Overall, the CTP2 strategy outlined in policy is strengthened by this commitment of funds. It just rests on Air Force environmental management at the Major Commands and installations to come up with cost effective P2 solutions to reduce compliance requirements.

**2. HQ ACC Level.** Environmental management at the HQ ACC level plays an integral role in the environmental funding process. It is responsible for validating

environmental requirements at ACC installations and submitting appropriate environmental budget estimates for environmental management at the HQ USAF level. Environmental management at the HQ ACC level may be required to defend these requirements and budget estimates to environmental management at the HQ USAF level. Environmental management at the HQ USAF level, in turn, submits approved requirements with budget estimates into the BPPBS cycle. If funds are approved, then money is passed from environmental management at the HQ USAF level down to ACC. Environmental management at the HQ ACC level then funds environmental projects and programs at ACC installations that it has previously approved.

With a general overview of the role of environmental management at ACC in the budget process, funding policy and budget execution processes within environmental management at the HQ ACC level are discussed.

Environmental management at ACC enforces funding policies established at the HQ USAF level. No additional policies for environmental funding are established at ACC, but they do provide specific guidance to implement HQ USAF environmental management policies at ACC installations. As previously seen in policy at the HQ USAF level, only EQ Class 0 and I requirements are being funded at the HQ ACC level (Wong, 1998). ACC is following this policy and requiring their installations to abide by this. All approved Class 0 and I requirements that are submitted to HQ USAF are being funded. Environmental management at ACC is also aware and supports the CTP2 strategy for funding environmental requirements. To support the CTP2 strategy, ACC is currently asking that its bases accomplish opportunity assessments for P2 solutions to compliance

requirements. In accomplishing this, environmental management is asking bases submit requirements in accordance with the revised AFI 32-7080, *Compliance Assurance and Pollution Prevention*. ACC is providing support to the installations by drafting a contract to identify and prioritize their bases' compliance sites, as well as, technically evaluate the top 5% of the sites for possible P2 solutions (Wood, 1998).

**3. Installation Level.** Environmental management at the installation level has a role in the environmental funding process. In accordance with policy established at the HQ USAF level and guidance from ACC, installations submit environmental requirements in budget submittals for funding. To receive appropriate funding for their requirements identified in their budget submittals, ACC installations have to justify and support their requirements to ACC so that ACC can justify and support those requirements to HQ USAF. Once requirements are approved, then funds are handed down from ACC to the installations so that those environmental requirements are fulfilled. With a general overview of the role of installation level environmental management in the funding process, specific policy and budget execution aspects are discussed in the following paragraphs.

As discovered in the installation level interviews accomplished for this investigative question, none of the interviewed installations developed their own policies for environmental funding. All abided by policy and guidance from HQ USAF and ACC. The installations expressed that compliance with higher level policies and guidance were required to gain environmental funding at their installations (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

As discovered in policy and interviews at the HQ USAF and HQ ACC levels, Flight Chiefs at each of the interviewed installations also expressed that currently only EQ Class 0 and I requirements are being supported and funded in Air Force environmental management. As a side note, all valid Class 0 and I requirements that are submitted from the interviewed installations are being funded. With regards to the different pillars, the majority of environmental funds are programmed and spent in the Cleanup or Compliance pillars. The variation between pillars at different installations is naturally due to existing environmental requirements at the installations. One installation had previous missions that now require extensive cleanup, while two others have prevailing compliance requirements under the Compliance pillar. Another installation has extensive cultural and natural resources that are perceived to require majority of the efforts and attention, but much of the installation's funding is actually received in the Compliance pillar (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). Past, present, and projected expenditures in the P2 and Conservation pillars at each of the installations comprise only a small percentage of their overall environmental budgets.

As indicated in previous CTP2 philosophy, environmental management at the HQ USAF and ACC levels is trying to reduce the rising costs in Compliance pillar requirements by substituting and implementing P2 solutions. The interviewed Flight Chiefs have been made aware of the CTP2 strategy and transition of funds from the Compliance pillar to the P2 pillar. They are presently developing P2 solutions to traditional compliance requirements. All the interviewed Flight Chiefs support the CTP2 strategy, but one has reservations about the transition of funds from Compliance to P2.



The reservation is that it is proving to be a hard task to find “cost effective” P2 solutions according to the payback criteria that are established for P2 initiatives (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

#### **F. Investigative Question #5 Findings**

Question #5 addresses what environmental management strategy was exhibited by the management structure of Air Force environmental management under the case study. Appendix B outlines the documented material examined as well as the personnel interviewed to answer the investigative question. The following paragraphs reveal the findings at each appropriate level within Air Force environmental management as scoped in the case study.

**1. HQ USAF Level.** Appendix K displays the organizational chart for the environmental organization at the HQ USAF Level. As seen in the chart, the Environmental Division is considered its own department in the corporate structure. The Environmental Division falls directly under the Office of The Civil Engineer which, in turn, falls directly under the Deputy Chief of Staff for Installations and Logistics. The Environmental Division is formed along functional lines and composed of five Branches. The Environmental Division Branches include International, Integration, Planning, Environmental Quality, and Restoration (Yaktus, 1998(a)).

The HQ USAF Environmental Division has the distinct responsibilities of developing Air Force environmental policy consistent with DoD guidance and obtaining resources to fulfill valid environmental requirements in the Air Force. Just as the Environmental

Division has distinct responsibilities, so does each of the Branches. The International Branch is in charge of environmental technology transfer and policy development for the Air Force in foreign lands. The Integration Branch's dominant responsibilities include developing and implementing environmental policy and integrating environmental requirements from the four pillars into the budget for the BPPBS cycle. The Planning Branch provides policy and guidance for oversight in cultural and natural resources programs, the Environmental Impact Analysis Process, and base comprehensive planning programs in Air Force environmental management. The Environmental Quality Branch is responsible for providing program guidance and policy in the Compliance and P2 pillars. Specific responsibilities include resource advocacy, budget allocation, training, and management guidance for the Compliance and P2 pillars in Air Force environmental management. The Restoration Branch is responsible for developing and implementing restoration (cleanup) policies, advocating required resources, and developing cost effective remediation technologies.

As part of the corporate structure, a HQ USAF level Environmental Protection Committee (EPC) exists. The function of the EPC is to review policies and programs, monitor policy and program progress, and advise leadership on environmental issues (DAF, 1994(b): paragraph 1). As indicated in Appendix L, almost every department at HQ USAF has an appointed member to the EPC. Membership is intended to "ensure that their areas of responsibility are considered in the interdisciplinary approach required to ensure proper consideration of environmental quality" (DAF, 1994(b): paragraph 3). An argument can be made that having such an inclusive membership fosters communication

on environmental issues between the Environmental Division and the other departments at HQ USAF. The EPC is co-chaired by The Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment as well as the Assistant Vice Chief of Staff (DAF, 1994(b): paragraph 3.1). By policy, the EPC at HQ USAF:

- Meets at least semi-annually or at the direction of the chairperson.
- Reviews adequacy of policies, resources and performance in meeting environmental goals and makes recommendations on changes required.
- Reviews environmental legislation and regulations and approves implementing policies.

(DAF, 1994(b): paragraph 4.2)

**2. HQ ACC Level.** In the corporate structure at ACC, the Environmental Division is directly subordinate to The Civil Engineer Directorate. The Environmental Division at ACC is functionally comprised of four branches. The four branches include the Analysis, Quality, Oversight, and Restoration Branches.

As a division, the Environmental Division is in charge of managing the “3.8 million acres of public lands entrusted to ACC, ensuring that ACC’s mission is carried out in harmony with the environment” (Blevins, 1998). To accomplish this, the Environmental Division implements and provides policy guidance for environmental programs, advocates for resources to fulfill valid environmental requirements, and provides environmental management support for ACC installations. Specifically, the Restoration Branch manages the cleanup program, the Analysis Branch manages the conservation and planning programs, the Quality Branch manages compliance and P2 programs, and the Oversight Branch manages training, competitive outsourcing, and ECAMP programs (Blevins, 1998).

Just as at the HQ USAF level, ACC has an EPC. The EPC at HQ ACC is named the Environmental Leadership Council (ELC) and its membership mirrors that of the EPC at HQ USAF (DAF, 1994(b): paragraph 3.2). The ELC is chaired by the Vice Commander of ACC. The responsibilities of the ELC include:

- Meet at least quarterly or at the direction of the chairperson
- Review and approve environmental impact analysis on proposed actions and forwards to the decision-maker
- Review environmental policy, resources, and performance and make recommendations on changes required
- Ensure appropriate training and manpower exist to meet environmental responsibilities

(DAF, 1998(b): paragraph 4.3)

The ELC at ACC meets quarterly and carries out the responsibilities outlined in AFI 32-7005 (HQ ACC/CEVO, 1998; Patrick, 1998(a)).

At ACC level, a primary purpose of the ELC is to:

Confirm to lower echelons that senior ACC leadership knows environmental concerns are important and must be dealt with under the frame work of mission execution which makes environmental execution mandatory as well.

(Patrick, 1998(a))

The ELC appears to be very effective in promoting active two-way communication between directorates at ACC. Involvement by executive leadership, such as ACC/CV, actively promotes discussions on environmental issues so ideas flow freely between the directorates (Patrick, 1998(a)).

**3. Installation Level.** The Environmental Flight is the main component of environmental management at the base level. At the interviewed installations in ACC, the Environmental Flight is a department within the Civil Engineer Squadron. The Civil Engineer Squadron is a subordinate unit under the Support Group which falls under the

respective Wing at the installation. Offices under the Environmental Flight are termed "elements" and each interviewed installation has a different element composition for their Environmental Flights. The flights are aligned functionally, though, to cover the four pillars of Cleanup, Compliance, Conservation, and P2. Variations on flight composition include elements to cover specific Compliance pillar programs such as water or air requirements, or combining pillars into one element (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

The responsibility of the Environmental Flight at each of the interviewed installations is to implement HQ USAF and ACC environmental policy and manage the environmental programs at their installations. As part of implementing policy and managing environmental programs, the flights identify environmental requirements and acquire appropriate resources to fulfill environmental requirements at their installations. The Environmental Flight also acts as the point of contact for Federal, State, and local environmental regulators and often for the general public when it concerns environmental matters at the installation (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998).

As an integral part of environmental management, Environmental Leadership Councils also exist at the installation level. ELC membership mirrors that at the HQ USAF and ACC levels and the Vice Wing Commander or Wing Commander serves as the Chair. The ELC also includes members for tenant unit organizations on the installation as well as a representative from the Defense Reutilization and Marketing Office and the Army and Air Force Exchange Service (DAF, 1994(b): paragraph 3.3). Some of the requirements for the ELC are to:

- Meet at least quarterly or at the direction of the chairperson
- Review and approve environmental impact analysis on proposed actions and forwards to the decision-maker
- Review environmental policy, resources, and performance and make recommendations on changes required
- Ensure appropriate training and manpower exist to meet environmental responsibilities

(DAF, 1994(b): paragraph 4.3)

To accomplish these requirements, all of the interviewed installations had cross-functional teams formed under the ELC to tackle special interest items (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). A prime example was a cross-functional team formed to identify personnel who needed environmental training and education requirements and exactly what requirements they needed to accomplish their duties (Dixon, 1998).

In interviews at the four installations, the Flight Chiefs believed that a primary purpose of the EPC was to ensure base-wide implementation of environmental policies and directives (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). Interviewees also expressed that the involvement of corporate leadership in the ELC provided an emphasis/driving force for environmental programs and concerns (Dixon, 1998; Miller, 1998). The interviewees believed that their installation's ELC was very effective in providing and fostering two-way communication between other organizations on base and environmental management (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). Environmental issues and concerns emphasized in the respective ELC's center on compliance requirements (Abrams, 1998; Dixon, 1998; Miller, 1998; Poland, 1998). It is

believed the reason for compliance requirements being emphasized is because this is where the vulnerability and liability lies (Miller, 1998; Poland, 1998).

## **VI. Case Study Analysis**

### **A. Introduction**

This chapter analyzes the findings in the previous chapter for the case study. Analysis is accomplished with respect to the previously developed analytical instrument. Through the analysis, an appropriate strategy is assigned for each individual structural aspect (policies, goals and objectives, funding, etc.). An appropriate summary of findings that justify the respective strategy assignment is also be given. Following the strategy assignments for each structural aspect, an overall environmental management strategy is assigned with appropriate justification.

### **B. Structural Aspects**

**1. Policies.** A strategy of *Proactively Compliant* is suggested for Air Force environmental management policies under the case study.

As reflected in AFPD 32-70, *Environmental Quality*, all levels within the Air Force are responsible for compliance with Air Force environmental policy (DAF, 1994(c): paragraph 2). Interviews disclosed that HQ ACC as well as the interviewed installations abide by Air Force environmental management policy at all levels.

Under AFPD 32-70 policy, the emphasis is placed on compliance with Federal, State, and local requirements. The current strategy in Air Force environmental management is shifting toward CTP2 to help satisfy compliance requirements. HQ ACC and the



interviewed installations are aware of the CTP2 strategy and are working to identify compliance requirements that can be satisfied with P2 solutions.

As part of policy in the P2, Conservation, and Compliance pillars, DoD EQ Class designators have been adopted and delineate P2 initiatives for funding priority. Current policy is to accomplish only EQ Class 0 and I activities that directly tie into immediate compliance requirements. Interviews at both the installation and ACC levels indicate that this policy is in effect at their respective levels.

**2. Goals and Objectives.** In the framework of the case study, the goals and objectives for Air Force environmental management suggest a strategy of *Proactively Compliant*. Even though Air Force environmental management does not have current objectives and goals for environmental management as a whole, the objectives and goals for the individual pillars do focus on compliance with external requirements. HQ ACC and the interviewed installations have objectives and goals oriented on compliance, also. Objective and goals at the HQ ACC and installation levels that are not directly focused on compliance issues, such as tracking customer feedback and accomplishing funding deadlines, are a means to ensure that the environmental management structure in the Air Force functions efficiently to accomplish compliance. Overall, with a compliance orientation, the goals and objectives support the focus of compliance in Air Force environmental management policy.

**3. Funding.** For the case study, Air Force environmental management funding suggests a strategy of *Proactively Compliant*. As indicated in the findings for investigative question #4, Air Force environmental management has a current policy of

funding only EQ Class 0 and I activities in the P2, Conservation, and Compliance pillars. The emphasis of these activities is to satisfy near term compliance requirements. Even with Air Force environmental funding getting tighter, the interviews indicated that all submitted EQ Class 0 and I requirements are currently being funded at each of the five installations. Programs, such as Legacy, fund programs outside of satisfying direct compliance needs, but these are not the norm.

**4. Training.** In the case study, environmental training in Air Force environmental management suggests a strategy of *Preventive*. Air Force environmental management has a formal system established for identifying and providing the needed environmental training to appropriate personnel. Designated environmental management personnel inside the environmental flights receive appropriate and extensive training with respect to the programs that they manage. Personnel outside the environmental flights that have a part in compliance related activities also are identified, scheduled, and receive appropriate environmental training to accomplish their compliance related duties. Personnel outside of the organization, such as the base populace and local community, also receive awareness level training in P2 and Conservation activities. Installation leadership receives awareness level training pertinent to installation level environmental programs and compliance issues. Air Force environmental management has a formal system established for identifying and providing the needed environmental training to its personnel.

**5. Management Structure.** In the case study, the management structure within Air Force environmental management suggests a strategy of *Preventive*. Whether at the

installation, MAJCOM, or HQ USAF level, environmental management is a separate distinct flight or division of overall management at that level. Environmental management at all levels has defined organizational structure with defined responsibilities. Personnel also have assigned job descriptions outlining their duties and responsibilities in environmental management. The Environmental Protection Committees (or equivalents) at each corporate Air Force level allow for all management personnel to be actively involved in environmental matters.

**6. Comprehensive Assessment.** Table 5 summarizes the suggested strategies for each structural aspect

**Table 5. Summarization of Suggested Strategies for Case Study**

<b>Structural Aspect</b>	<b>Environmental Management Strategy</b>
Policies	Proactively Compliant
Goals and Objectives	Proactively Compliant
Funding	Proactively Compliant
Training	Preventive
Management Structure	Preventive

As the previous table indicates, a strategy of *Proactively Compliant* exists for policies, goals and objectives, and funding in this case study and a strategy of *Preventive* exists for the structural aspects of training and management structure. The strongest components of the five researched structural aspects presented are policies and funding in Air Force environmental management. As previously found at the installation and ACC levels, if programs or initiatives do not adhere to policy, then appropriate funding can not and will not occur. Appropriate funding is necessary for viable programs and initiatives. Since

the respective policies and funding in Air Force environmental management guide a *Proactively Compliant* strategy, a *Proactively Compliant* strategy is suggested for the comprehensive assessment.

## **VII. Conclusions and Recommendations**

### **A. Introduction**

After disclosing the findings and analysis for the case study, appropriate conclusions and recommendations are discussed in this chapter. The conclusions incorporated in this chapter aim to summarize the obtained results for the analysis and findings of this research and link them to the overall research objective. Recommendations are then given to direct further study for broadening the knowledge of environmental management in public and profit sector organizations.

### **B. Conclusions**

The overall research objective was to investigate environmental management strategies in public sector organizations. To guide the research the following investigative questions were developed:

1. What is an appropriate environmental strategy typology for investigating responses in public sector organizations?
2. How can one investigate structural aspects of an organization?
3. What environmental strategy do the structural aspects of Air Force environmental management reflect?

In response to question #1, previous models and typologies were synthesized to develop an appropriate environmental strategy typology to investigate environmental management strategies in public sector organizations. In answering question #2, it was

realized that with the absence of other environmental drivers, such as financial and market influences, structural drivers contribute to how public sector organizations progress in the environmental continuum. With the impact of structural drivers on public sector organizations, an analytical instrument was developed to investigate structural aspects of organizations. With the current development, acceptance, and implementation of the ISO 14000 series and other widely accepted environmental management standards in corporate environmental management, a foundation had existed to investigate certain structural aspects found in the ISO 14000. Specific structural aspects derived from the ISO 14000 and other widely supported environmental management standards include policy, goals and objectives, funding, training, and management structure. In response to question #3, a case study was accomplished involving Air Force environmental management at HQ USAF, HQ ACC, and four installations under HQ ACC.

In using the developed analytical instrument, the following investigative questions for the case study were answered:

1. What environmental management strategy do Air Force policies reflect?
2. What environmental management strategy do Air Force objectives and goals reflect?
3. What environmental management strategy does Air Force education and training reflect?
4. What environmental management strategy does Air Force funding reflect?
5. What environmental management strategy does the management structure of Air Force environmental management reflect?

Table 6 outlines the results of the analysis in the context of the case study's investigative questions.

**Table 6. Case Study Investigative Questions and Associated Strategies**

<b>Investigative Question</b>	<b>Environmental Management Strategies</b>
Question #1	Proactively Compliant
Question #2	Proactively Compliant
Question #3	Preventive
Question #4	Proactively Compliant
Question #5	Preventive

An overall assessment was accomplished by considering each structural aspect and associated strategy for Air Force environmental management in the case study. An overall environmental management strategy of *Proactively Compliant* was suggested for the case study.

With the previous summary of results, several conclusions can be drawn. First, the developed environmental management strategy typology and analytical instrument did provide a viable foundation for evaluating environmental management strategies in the case study. In retrospect, even though the typology is particular to public sector organizations, the developed analytical instrument for structural aspects can be used for both public and profit sector organizations. As mentioned in the literature review, financial and market influences to progress in the environmental continuum do not seem to apply to public sector organizations. Without these financial and market influences, structural influences can have a significant role in progressing public sector organizations along the environmental continuum. Therefore, having an analytical instrument to

investigate structural aspects of organizations is significant for investigating environmental management strategies in public sector organizations.

Second, as indicated in the literature review chapter, public sector organizations have to rely on receiving funding through an appropriation system from the public rather than a direct market. This appropriation system is evident in the case study and due to lack of funds in the appropriations, Air Force environmental management is forced to establish a budget based on compliance issues rather than programs and initiatives that move beyond compliance of external requirements.

The third finding that can be drawn from this research is that by having *Proactively Compliant* and *Preventive* strategies exhibited in the case study, there is an indication of consistency in the structural aspects for Air Force environmental management. Since the two strategies are situated side-by-side on the continuum, the structural aspects of environmental management support each other for a common strategy. Inconsistencies in environmental management would have occurred if one would observe an *Inactive* strategy for one or several aspects in the case study and then an *Assertive* strategy for the others.

In the same respect that the strategies in the case study were consistent, the findings at each level within Air Force environmental management were consistent. As an example, the policies that were developed at the HQ USAF level were supported at the HQ ACC level and put into practice at the installation level.

Another conclusion to be made is that in this research there is support for the previously discussed differences between public and profit sector organizations. In



particular, Rainey, Backoff, and Levine discuss the regulatory peculiarities that differ among the two sectors. They propose that public sector organizations not only have to contend with the external legal requirements that profit sector organizations contend with, but have more highly hierarchical and bureaucratic controls (Rainey, Backoff, and Levine, 1976: 238). As evident in this research, not only does Air Force environmental management have to contend with external legal environmental requirements, but elaborate funding guidelines that control how environmental funds are managed in the Air Force. The Air Force also has to justify its funding requirements to Congress to accomplish environmental programs. These funding guidelines can be arguably attributed to the extensive accountability system of checks and balances required by the public.

The last conclusion to be made for this research pertains to the performance of the comprehensive assessment in the case study. In accomplishing the subjective assessment, there is room for bias involved on the part of the analyst performing the investigation. Bias can sway the emphasis on one or more of the structural aspects and allow the analyst to assign an overall assessment that leans toward that emphasis. To alleviate this bias, adequate justification tied to the findings has to be given to assign a comprehensive environmental management strategy for the case study.

### **C. Recommendations for Further Study**

The first recommendation for further study pertains to the developed analytical instrument for investigating structural aspects in organizations. Further testing of the

instrument needs to be accomplished on other organizations to solidify it as a valid instrument for the typology.

Beyond the developed analytical instrument, to develop the typology into a more rigorous model, more testing and application has to be accomplished on public sector organizations. In doing this testing and application, other analytical instruments must be developed to investigate the other forces, besides structure, for propelling public sector organizations in the environmental continuum.

A third recommendation for further study is intended to build on this research in the case study. This recommendation is to investigate the other Major Commands. As previously discussed in the constraints, this research is not representative of what exists in the other Major Commands. By investigating the other Major Commands, there would be a better indication of what environmental strategies are exhibited in the structural aspects of environmental management throughout the Air Force.

Another recommendation for further study coincides well with the second recommendation. The recommendation is to sample all the installations within ACC or other Major Commands. An investigation of all the installations within a Major Command would provide a more complete representation of what exists for environmental management within that Command.

The last recommendation for further study pertains to the performance of the comprehensive assessment in the case study. In accomplishing the subjective assessment, there is room for bias involved on the part of the analyst performing the investigation. Bias can sway the emphasis toward one or more of the structural aspects and allow the

analyst to assign an overall assessment that leans toward that emphasis. To alleviate the bias in this investigation, adequate justification tied to the findings has to be given to assign a comprehensive environmental management strategy for the case study. For further research, other methods can be developed to further alleviate bias and gain more validity in assigning a comprehensive environmental management strategy for case studies.

## Appendix A: Interview Questions

### **I. BASIC INFORMATION (Interviewees)**

1.	NAME:		
2.	TITLE:		
3.	ORGANIZATION:		
4.	MAILING ADDRESS:		
5.	PHONE:		
6.	FAX:		
7.	E-MAIL ADDRESS:		
8.	TIME IN CURRENT POSITION:	YRS:	MO:
9a.	EXPERIENCE IN ENVIRONMENTAL FIELD	YRS:	MO:
9b.	List past experience in environmental field, if applicable:		
10.	EDUCATION LEVEL (List undergraduate and graduate degrees held):		

## II. Structure Questions:

Aspects:

I. Policies

II. Goals and Objectives

III. Funding

IV. Training

V. Management Structure

	Question	Aspect	HQ/USAF	MAJCOM	Base
1.	Of the "four pillars" of environmental management, which pillar receives the most emphasis? Why?	I, II, III, IV, V	X	X	X
2.	An example policy or mission statement for environmental management could be "conserve natural resources." With this in mind, what is your mission statement for environmental management? May I have a hard copy, if applicable?	I		X	X
3.	An example objective for the previous "conserve natural resources" policy/mission statement could be "minimize water use". With this in mind, what are your objectives for environmental management? Are they published, and if so, may I have a copy?	II		X	X
4.	An example goal for the previous "minimize water use" objective could be "reduce water usage in housing by 15%." With this in mind, what are your goals to follow your objectives for environmental management? Are they published, and if so, may I have a copy?	II		X	X
5.	At the HQ USAF level, AFD 32-70, <i>Environmental Quality</i> , lays the broad groundwork for environmental management in the Air Force. Do you have an equivalent document or possibly a supplement to AFD 32-70. If so, may I obtain a copy?	I		X	X
6.	Do you have any supplements to the environmental related AFI's? If so, what are they (possibly get copies that might relate)?	I		X	X
7.	Do individual shops on base have environmental management related policies that you have developed or they have developed? If so, what are they and what was the reason for their development (laws, proactive organizations, etc.)?	I			X
8.	Do individual shops on base have environmental management objectives and goals? If so, what are they and why were they developed (non-compliance, EPC directed, proactive organization, etc.)?	II			X
9.	When considering the "four pillars" and funding of them, where is most of the emphasis placed? Why?	III	X	X	X
10.	Do you have any supplements to HQ USAF (or ACC if applicable) funding guidance? If so, may I have a copy of it?	III		X	X
11.	What are your past and projected funding for the four pillars (If available, past and future 5 years)?	III	X	X	X

## II. Structure Questions (cont'd):

Aspects:

I. Policies

II. Goals and Objectives

III. Funding

IV. Training

V. Management Structure

	Question	Aspect	HQ/USAF	MAJCOM	Base
12.	Do you have enough funding to accomplish all compliance (requirements established by law, policy, etc.) initiatives?	III	X	X	X
13.	As of 12 Sep 97, HQ USAF/ILEV established new funding guidance for the P2 program and updated it with DoD EQ Class definitions. Do you notice variation on funding for the different EQ Classes? If so, how do they vary?	III	X	X	X
14.	AFI 32-7087, <i>Environmental Education, Training, and Career Development</i> , is currently being developed. It provides guidance for establishing, implementing and managing environmental education and training programs in the Air Force. Did the structure and processes outlined in this newly developed AFI put down in writing what was previously in existence?	IV	X		
15.	What was the driver for AFI 32-7087 being developed?	IV	X		
16.	Is funding a big player on what training is identified and developed in the environmental education and training process?	IV	X		
17.	Is environmental education and training directly tied to requirements (compliance with laws, etc.), or does it go beyond compliance requirements (i.e. - more progressive than what the law requires)?	IV	X		
18.	An example of environmental management awareness training is a briefing to the base populace to educate personnel about environmental management policies, objectives, and goals. What type of awareness training for environmental management do you provide?	IV			X
19.	How available is appropriate training for personnel in your flight who manage environmental management programs?	IV			X
20.	What type of environmental management does senior management at your base receive? Who exactly receives it?	IV			X
21.	Do you identify personnel who are directly involved in compliance actions (at the shop level)?	IV			X
22.	For those involved in compliance (shop personnel), do they receive appropriate training? If so, who identifies it and funds it?	IV			X

## II. Structure Questions (cont'd):

Aspects:

I. Policy

II. Goals and Objectives

III. Funding

IV. Training

V. Management Structure

	Question	Aspect	HQ/USAF	MAJCOM	Base
23.	What type of environmental management training do you control/schedule/coordinate?	IV		X	X
24.	Do you have a published organizational chart for environmental management? If so, may I have a copy?	V	X	X	X
25.	Do job descriptions of environmental management personnel reflect assigned environmental management duties? If so, may I have a copy of one?	V			X
26.	AFI 32-7005, <i>Environmental Protection Committees</i> , broadly outlines the role and responsibility of the Environmental Protection Committee (EPC). How often does your EPC meet?	V	X	X	X
27.	What do you feel is the primary purpose of the EPC at your level (base/MAJCOM/HQ USAF)?	V	X	X	X
24.	How effective is the EPC in accomplishing the necessary two-way communication between your organization and other organizations at your level (base/MAJCOM/HQ USAF)?	V	X	X	X
25.	Of the "four pillars" (cleanup, compliance, conservation, and P2), which pillar does the EPC most actively involve itself with? Why is this the case?	V	X	X	X
26.	Do any of your activities/programs in the Conservation pillar go beyond compliance with laws, executive orders, etc.? If so, can you describe some of those activities/programs?	I		X	X
27.	Do any of your activities/programs in the Pollution Prevention pillar go beyond compliance with laws, executive orders, etc.? If so, can you describe some of those activities/programs?	I	X	X	X

## Appendix B: Documentation and Personnel

### I. Documentation Used for Investigative Question #1:

Document	Level
Air Force Policy Directive (AFPD) 32-70, <i>Environmental Quality</i> , 20 July 1994	HQ USAF
Air Force Instruction (AFI) 32-7080, <i>Pollution Prevention Program</i> , 12 May 1994	HQ USAF
Air Force Instruction (AFI) 32-7064, <i>Integrated Natural Resources Management</i> , 1 August 1997	HQ USAF
Air Force Instruction (AFI) 32-7065, <i>Cultural Resources Management</i> , 13 June 1994	HQ USAF
Department of Defense Instruction (DODI) 4715.4, <i>Pollution Prevention</i> , 18 June 1996	Department of Defense (considered a HQ USAF level document)
Department of Defense Instruction (DODI) 4715.3, <i>Environmental Conservation Program</i> , 3 May 1996	Department of Defense (considered a HQ USAF level document)
Environmental Quality Handbook, 5 Sep 1997	Air Combat Command
Draft Revision for Air Force Instruction (AFI) 32-7080, <i>Compliance Assurance and Pollution Prevention</i> , (Draft version as of 24 November 1998)	HQ USAF
Pollution Prevention Funding Guidance, Memorandum for HQ USAF/ILEV, 12 September 1997	HQ USAF

### II. Personnel Interviewed for Investigative Question #1:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Col Michael Patrick	HQ ACC/CEV	Chief, Environmental Programs Division	1 year 6 months	E-mail	23 Dec 98
Capt Tim Wood	HQ ACC/CEVQP	Pollution Prevention Program Manager	1 year	E-mail	23 Nov 98 & 24 Nov 98
Mr. Roy Barker	HQ ACC/CEVP	Command Natural Resources Manager	13 years	E-mail	23 Nov 98
Mr. Marshall Dixon	20 CES/CEV (Shaw AFB, SC)	Environmental Flight Chief	5 years 4 months	Telephone	18 Nov 98
Mr. John Poland	49 CES/CEV (Holloman AFB, NM)	Environmental Flight Chief	4 years 9 months	E-mail and Telephone	19 Nov 98 & 10 Dec 98
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	25 Nov 98 & 9 Dec 98



## II. Cont'd:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	23 Dec 98
Mr. Greg Miller	9 CES/CEV (Beale AFB, CA)	Environmental Flight Chief	3 years	E-mail	23 Nov 98 & 24 Nov 98

## III. Documentation Used for Investigative Question #2:

Document	Level
Air Combat Command, Directorate of Civil Engineering, Environmental Division Business Plan, 1998 ( <a href="http://wwwmil.acc.af.mil/ce/cev/bizplan.html">http://wwwmil.acc.af.mil/ce/cev/bizplan.html</a> as of 9 November 1998)	Air Combat Command
Air Force Pollution Prevention Strategy	HQ USAF
Programming and Budgeting Environmental Funding Briefing, HQ USAF/ILEVA (Presentation by Maj Keith Yaktus), 10 December 1998	HQ USAF
Programming and Budgeting Environmental Funding Briefing, HQ USAF/ILEVA (Presentation by Lt Col Jeff Pitchford), 12 February 1998	HQ USAF
Air Force Environmental Compliance Assessment and Management Program Briefing, HQ AFCEE/EQP (Presentation by Mr. Scott Newquist), October 1997	HQ USAF
Environmental Quality Handbook, 5 September 1997	Air Combat Command

## IV. Personnel Interviewed for Investigative Question #2:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Major Keith Yaktus	HQ USAF/ILEVA	Environmental Program Manager	1 year 5 months	E-mail and Personal	12 Nov 98, 16 Nov 98 & 10 Dec 98
Daniel J. Block	AFIT/CEV	Chief, Restoration Section	3 years	E-mail	4 Jan 99
Mr. Roy Barker	HQ ACC/CEVP	Command Natural Resources Manager	13 years	E-mail	4 Jan 99

#### IV. Cont'd:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Mr. Anthony Negri	AFIT/CEV (considered as HQ USAF level)	Associate Professor of Continuing Education in Environmental Management	7 years 6 months	Personal	18 Nov 98
Mr. Marshall Dixon	20 CES/CEV (Shaw AFB, SC)	Environmental Flight Chief	5 years 4 months	Telephone	18 Nov 98
Mr. John Poland	49 CES/CEV (Holloman AFB, NM)	Environmental Flight Chief	4 years 9 months	E-mail and Telephone	19 Nov 98 & 10 Dec 98
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	25 Nov 98 & 9 Dec 98
Mr. Greg Miller	9 CES/CEV (Beale AFB, CA)	Environmental Flight Chief	3 years	E-mail	3 Dec 98

#### V. Documentation Used for Investigative Question #3:

Document	Level
Air Force Instruction (AFI) 32-7087, <i>Environmental Education, Training, and Career Development</i> (Final Draft version as of 18 Nov 98)	HQ USAF
Environmental Leadership Council Minutes, 13 March 1998	HQ ACC
Department of Defense Instruction (DODI) 4715.10, <i>Environmental Education, Training and Career Development</i> , 24 April 1996	Department of Defense (considered a HQ USAF level document)

#### VI. Personnel Interviewed for Investigative Question #3:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Ms. Tamee Tennison	HQ AFCEE/ (considered HQ USAF level)	Environmental Education and Training Program Support Manager	3 years	E-mail and Telephone	18 Nov 98, 19 Nov 98, 20 Nov 98, & 8 Dec 98

# **VI. Cont'd:**

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Mr. Marshall Dixon	20 CES/CEV (Shaw AFB, SC)	Environmental Flight Chief	5 years 4 months	Telephone	18 Nov 98
Mr. John Poland	49 CES/CEV (Holloman AFB, NM)	Environmental Flight Chief	4 years 9 months	E-mail and Telephone	19 Nov 98 & 10 Dec 98
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	25 Nov 98 & 9 Dec 98
Mr. Greg Miller	9 CES/CEV (Beale AFB, CA)	Environmental Flight Chief	3 years	E-mail	3 Dec 98

# **VII. Documentation Used for Investigative Question #4:**

Document	Level
Pollution Prevention to Achieve Compliance, Memorandum from HQ USAF/ILEV, 20 August 1997	HQ USAF
Pollution Prevention Funding Guidance, Memorandum from HQ USAF/ILEV, 12 September 1997	HQ USAF
Pollution Prevention to Achieve Compliance, Memorandum from HQ USAF/ILE, 20 November 1997	HQ USAF
Transferring Funds from Environmental Compliance to Pollution Prevention, Memorandum from HQ USAF/ILE, 28 January 1998	HQ USAF
Environmental Compliance Through Pollution Prevention, Memorandum from HQ USAF/IL, 20 April 1998	HQ USAF
Air Combat Command Approach to Funding Compliance Through Pollution Prevention, Paper by Capt Timothy Wood (HQ ACC/CEVQP) in the Proceedings of the Third Annual Joint Service Pollution Prevention Conference and Exhibition, 25-28 August 1998	Air Combat Command
Air Force Instruction (AFI) 32-7001, <i>Environmental Budgeting</i> , 9 May 1994	HQ USAF
Programming and Budgeting Environmental Funding Briefing, HQ USAF/ILEVA (Presentation by Maj Keith Yaktus), 10 December 1998	HQ USAF

#### VIII. Personnel Interviewed for Investigative Question #4:

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Major Keith Yaktus	HQ USAF/ILEVA	Environmental Program Manager	1 year 5 months	E-mail	12 Nov 98 & 16 Nov 98
Capt Kevin Wong	HQ ACC/CEVQR	Environmental Requirements Manager	1 year 3 months	E-mail	16 Nov 98
Mr. Anthony Negri	AFIT/CEV (considered as HQ USAF level)	Associate Professor of Continuing Education in Environmental Management	7 years 6 months	Personal	18 Nov 98
Mr. Marshall Dixon	20 CES/CEV (Shaw AFB, SC)	Environmental Flight Chief	5 years 4 months	Telephone	18 Nov 98
Mr. John Poland	49 CES/CEV (Holloman AFB, NM)	Environmental Flight Chief	4 years 9 months	E-mail and Telephone	19 Nov 98 & 10 Dec 98
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	25 Nov 98 & 9 Dec 98
Mr. Greg Miller	9 CES/CEV (Beale AFB, CA)	Environmental Flight Chief	3 years	E-mail	3 Dec 98

#### IX. Documentation Used for Investigative Question #5:

Document	Level
Programming and Budgeting Environmental Funding Briefing, HQ USAF/ILEVA (Presentation by Maj Keith Yaktus) , 10 December 1998	HQ USAF
HQ ACC Staff Directory (located at <a href="http://www.mil.acc.af.mil/ce/cev/Directory/hqdirectory.html">http://www.mil.acc.af.mil/ce/cev/Directory/hqdirectory.html</a> as of 9 Nov 1998)	Air Combat Command
"The Protect Team" HQ ACC Environmental Programs Division home page (located at <a href="http://www.mil.acc.af.mil/ce/cev/cev_mainpage.html">http://www.mil.acc.af.mil/ce/cev/cev_mainpage.html</a> as of 9 November 1998)	Air Combat Command
49 CES/CEV "The Environmental Flight" (organizational chart with job responsibilities)	49 CES/CEV (Holloman AFB, NM)
4 CES/CEV Manning Slide and Position Description for Environmental Scientist	4 CES/CEV (Seymour Johnson AFB, NC)

**X. Personnel Interviewed for Investigative Question #5:**

Name	Level or Installation	Position	Time in Position	Interview Type	Date(s)
Col Michael Patrick	HQ ACC/CEV	Chief, Environmental Programs Division	1 year 6 months	E-mail	23 Dec 98
Mr. Marshall Dixon	20 CES/CEV (Shaw AFB, SC)	Environmental Flight Chief	5 years 4 months	Telephone	18 Nov 98
Mr. John Poland	49 CES/CEV (Holloman AFB, NM)	Environmental Flight Chief	4 years 9 months	E-mail and Telephone	19 Nov 98 & 10 Dec 98
Mr. Donald Abrams	4 CES/CEV (Seymour Johnson AFB, NC)	Environmental Flight Chief	5 years 10 months	E-mail	25 Nov 98 & 9 Dec 98
Mr. Greg Miller	9 CES/CEV (Beale AFB, CA)	Environmental Flight Chief	3 years	E-mail	3 Dec 98
Major Keith Yaktus	HQ USAF/ILEVA	Environmental Program Manager	1 year 5 months	E-mail	10 Dec 98

### **Appendix C. The Environmental Quality Pillars**

1. Cleanup. The Air Force will reduce health and environmental risks created or caused by past operations. At each installation, the Air Force will move as rapidly as possible to identify, characterize, and clean up contamination. The Air Force will ensure open, unbiased, and comprehensive processes for cost-effective cleanup and protection of human health and public well-being by involving the public and regulatory agencies in the clean-up activities. At locations in foreign countries, the Air Force will restore sites contaminated by Air Force activities to sustain current operations and eliminate known imminent and substantial dangers to human health and safety.
2. Compliance. The Air Force will comply with applicable Federal, State, and local environmental laws and standards. Air Force activities in foreign countries will comply with the Department of Defense (DoD) Final Governing Standards, or in their absence, the environmental criteria of the DoD Overseas Environmental Baseline Guidance Document. Air Force deployment plans will identify the necessary resources and assign specific responsibilities to comply with applicable standards. Consistent with security requirements, the Air Force will support environmental compliance inspections of its operations and activities worldwide, and will aggressively correct areas not in compliance.
3. Conservation. The Air Force will conserve natural and cultural resources through effective environmental planning. The environmental consequences of proposed actions and reasonable alternatives will be integrated into all levels of decision making. The environmental resources under Air Force stewardship will be protected and managed in the public interest. Environmental opportunities and constraints will be the foundation of comprehensive plans for installation development.
4. Pollution Prevention. The Air Force will prevent future pollution by reducing use of hazardous materials and releases of pollutants into the environment to as near zero as feasible. This will be done first through source reduction, e.g. chemical substitution, process change and other techniques. Where environmentally damaging materials must be used, their use will be minimized. When the use of hazardous materials cannot be avoided, the spent material and waste will be reused or recycled whenever possible. When spent material and waste cannot be reused or recycled, dispose of the spent material and waste as a last resort in an environmentally safe manner, consistent with the requirements of all applicable laws. Environmental costs will be accounted for in computing hazardous material life-cycle costs.

(DAF, 1994(c): paragraphs 3.1-3.4)

## **Appendix D. Environmental Quality Classes**

**Class 0** - Includes activities needed to cover the recurring administrative, personnel and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (Federal, State, and local laws, regulations, E.O.s, DoD policies, and Final Governing Standards overseas or the "Overseas Environmental Baseline Guidance Document" (reference (c)) or which are in direct support of the military mission. Also, includes environmental management activities associated with the operation of facilities, installations and deployed weapon systems. Recurring costs consist of manpower, training, supplies, hazardous waste disposal, operating recycling activities, permits, fees, testing and monitoring and/or sampling and analysis, reporting and record keeping (e.g., Toxic Release Inventory reporting), maintenance of environmental equipment, and compliance self assessments.

**Class I** - Projects and activities needed that are currently out of compliance (have received an enforcement action from a duly authorized Federal, State, or local authority; have a signed compliance agreement or received a consent order; and/or have not met requirements based on applicable Federal, State, and local laws, regulations, E.O.s, DoD policies, and Final Governing Standards overseas or the Overseas Environmental Baseline Guidance Document (reference (c))). This class also includes projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable requirements, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented within the current program year. Those activities include the preparation of plans (e.g., National Environmental Policy Act, 42 U.S.C 4321-4370(d) (reference (ee)), documentation, master plans, emergency response plans, integrated natural and cultural resource management plans, pollution prevention plans; etc.), opportunity assessments and inventories. The preferred approach is to use pollution prevention projects or activities, if cost effective, to bring a facility into compliance. Overseas, that class includes projects and activities necessary to alleviate the human health threats to ongoing operations or necessary to comply with applicable treaties and agreements.

**Class II** - Projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable Federal, State, and local laws, regulations, E.O.s, DoD policies and Final Governing Standards overseas or reference (c), but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented in time to meet an established deadline beyond the current program year. The preferred approach is to use pollution prevention projects or activities, if cost effective, as the means of maintaining or bringing a facility into compliance. Overseas, that class includes projects and activities identified using risk based prioritization practices that meet the long term objective of full implementation of

the Final Governing Standards for each foreign country where DoD maintains substantial installations.

Class III - Includes projects and activities that are not explicitly required by law but are needed to address overall environmental goals and objectives.

(DoD, 1996(b): paragraph E3.1.9)



## **Appendix E. Pollution Prevention Project Categories**

Recurring Requirements - Pollution Prevention Operations and Services (O&S) include annual “must do” services and projects associated with “keeping the gates open” such as management plans, baseline surveys, and so on.

### Non-recurring Requirements:

Level P1: Ozone Depleting Chemical (ODC) and Legal Requirements - Level P1 projects and services seek to:

- Eliminate dependence on ozone depleting chemicals.
- Satisfy pollution prevention Federal, State or local laws and regulations.
- Satisfy pollution prevention Executive Orders.

Level P2: Meet Future Air Force Goals, Policies, and Legal Requirements - Level P2 projects and services seek to meet future Air Force goals, policies, and legal requirements (such as laws, executive orders, and so on). These projects represent situations in which existing operations, programs, and facilities meet current standards, but require action in order to meet future Federal or DoD legal requirements, Air Force Pollution Prevention Action Plan goals, objectives, and sub-objectives.

Level P3: Beyond Air Force Goals and Legal Requirements - Level P3 projects and services go beyond Air Force Pollution Prevention Action Plan goals, DoD goals, and legal requirements.

(DAF, 1994(d): paragraph 2.6.2; DAF, 1994(a): paragraph 5.3)

## **Appendix F. Environmental Quality Classes for Conservation**

**Class 0: Recurring Natural and Cultural Resources Conservation Management Requirements** - Includes activities needed to cover the recurring administrative, personnel, and other costs associated with managing DoD's conservation program that are necessary to meet applicable compliance requirements (Federal and State laws, regulations, Presidential Executive orders, and DoD policies) or which are in direct support of the military mission. Also included are environmental management activities associated with the operation of facilities, installations, and deployed weapons systems. Recurring costs consist of manpower, training, supplies, hazardous waste disposal, operating recycling activities, permits, fees, testing and monitoring and/or sampling and analysis, reporting and record keeping, maintenance of environmental conservation equipment, and compliance self-assessments.

**Class I: Current Compliance** - Includes projects and activities needed because an installation is currently out of compliance (has received an enforcement action from a duly authorized Federal or State agency, or local authority); has a signed compliance agreement or has received a consent order; has not met requirements based on applicable Federal or State laws, regulations, standards, Presidential Executive orders, or DoD policies, including those listed in enclosure 2: and/or are immediate and essential to maintain operational integrity or sustain readiness of the military mission. "Class I" also includes projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, DoD policies, or Presidential Executive orders, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented in the current program year. Those activities include the following:

1. Environmental analyses for natural and cultural resource conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources.
2. Planning (e.g., 42 U.S.C 4341 (reference (d)) documentation, master plans, and integrated natural and cultural resource management plans, etc.)
3. Baseline inventories of natural and cultural resources.
4. Biological assessments, surveys, or habitat protection for a specific listed species, critical for the protection of the species so that proposed or continuing actions can be modified in consultation with the U.S. Fish and Wildlife Service or the U.S. National Marine and Fisheries Service to prevent "taking" of the species.

5. Inventories and surveys of historical and archeological sites critical for the protection of cultural resources so that continuing actions can be modified in consultation with the Advisory Council for Historic Preservation.

6. Mitigation to meet existing regulatory permit conditions or written agreements, such as those required under Section 4341 of 42 U.S.C., Sections 1361-1407, 703, and 470 et seq. Of 16 U.S.C., and Section 1251 et seq. Of 32 U.S.C., and (references (d), (h), and (p)), and included in documents required by Section 4341 of 42 U.S.C. (reference (d)).

7. Nonpoint source pollution or watershed management studies or actions needed to meet compliance dates cited in approved State coastal nonpoint source pollution control plans, as required to meet consistency determinations under Sections 1451 et seq. and 703 et seq. of 16 U.S.C. (reference (h)).

8. Wetlands delineation, following existing statutory requirements, critical for the prevention of adverse impacts to wetland without a permit so that continuing actions can be modified to ensure mission continuity, as required by 32 U.S.C. 1251 et seq. (reference (p)).

9. Efforts to achieve compliance with requirements that have deadlines that have already passed, as cited in DoD executed agreements, such as support for the Chesapeake Bay Agreement Action Plan and the DoD Mojave Desert Ecosystem Management Initiative.

10. Initial curation of archeological materials, as required under 32 CFR 22 and 229, Section 470 aa-11 of 16 U.S.C. and 36 CFR 78 and 79, and (references (w), (h), and (e)).

11. Consultations with Native American groups, if reinterment of Native American remains under 25 U.S.C. 3001 (reference (u)) is part of their wishes.

Class II: Maintenance Requirements - Includes those projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, Presidential Executive orders, or DoD policies) but deadlines have not passed or requirements are not in force, but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Examples include the following:

1. Compliance with future requirements that have deadlines.

2. Conservation and Geographic Information System mapping in order to be in compliance with Federal, State and local regulations, Presidential Executive orders, and DoD policy.

3. Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives, such as Coastal America, the "Chesapeake Bay Agreement Action Plan," and "Mojave Desert Ecosystem Management Initiative."

4. Wetlands enhancement, in order to achieve the President's order for "no net loss" or to achieve enhancement of existing degraded wetlands, as required under E.O. 11990 (reference (1)) and 32 U.S.C. 1251 et seq. (reference (p)).

5. Public education programs that educate the public on the importance of protecting archeological resources as required by Section 470 aa-11 of 16 U.S.C (reference (h)).

Class III: Enhancement Actions Beyond Compliance - Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or Executive order and are not of an immediate nature. Examples include the following:

1. Community outreach activities, such as "Earth Day" and "Historic Preservation Week" activities.

2. Educational and public awareness projects, such as interpretive displays, oral histories, "watchable wildlife" areas, nature trails, wildlife checklists, and conservation teaching materials.

3. Biological assessments, surveys, or habitat protection for a candidate species for listing as "endangered or threatened."

4. Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action.

5. Reinterment of Native American remains on land managed or controlled by the Department of Defense.

6. Management and execution of volunteer and partnership programs.

(DoD, 1996(a): Encl. 4)

### Appendix G. Comparison of Air Force P2 Goals and ACC P2 Goals

The Air Force has established the following P2 goals:

<b>Program Element</b>	<b>Baseline Year</b>	<b>Goal</b>
Hazardous Waste Reduction	1992	25% reduction in disposal by 31 Dec 96 50% reduction in disposal by 31 Dec 99
TRI Chemical Releases	1994	50% reduction of total releases and off-site transfers by 1999
Pesticide Management	FY93	50% reduction in pounds of active ingredient by FY 2000
Volatile Air Emissions	1993	50% reduction in pounds released by 31 Dec 99
Solid Waste Reduction	1992	30% reduction in disposal by 31 Dec 96
Environmentally Preferable Products	N/A	Purchase of products containing recycled material
Energy Conservation	1985	10% reduction in BTU/sq ft by 1995 20% reduction in BTU/sq ft by 2000 30% reduction in BTU/sq ft by 2005

In addition to the AF goals listed above, ACC has established the following goals:

<b>Program Component</b>	<b>Baseline Year</b>	<b>Goal</b>
Hazardous Waste Reduction	1992	50% reduction in disposal by 31 Dec 97 60% reduction in disposal by 31 Dec 99 80% reduction in disposal by 31 Dec 05
Hazardous Material Usage Goal	Annual	To be established by ACC annually
Ozone Depleting Substances (ODS)	1992	99% usage reduction by 31 Dec 98
Solid Waste Reduction	1992	70% reduction in disposal by 31 Dec 05
Solid Waste Recycling	1992	30% recycling rate by 31 Dec 97 50% recycling rate by 31 Dec 05

(HQ ACC/CEVQ, 1997: 15-2)

## **Appendix H. Hazard Severity Category Definitions**

**Catastrophic** - complete mission failure, loss of system, loss exceeding \$1M, death, permanent total disability, or irreversible environmental damage that violates law or regulation.

**Critical** - Major mission degradation, major system damage, loss exceeding \$200K but less than \$1M, permanent partial disability, severe injury or occupational illness that may result in hospitalization of at least three personnel, or reversible environmental damage causing a violation of law or regulation.

**Marginal** - Minor mission degradation, minor system damage, loss exceeding \$10K but less than \$200K, injury or minor occupational illness resulting in a lost work day, or mitigable environmental damage where restoration activities can be accomplished without violation of law or regulation.

**Negligible** - Less than minor mission degradation, minor system damage, loss exceeding \$2K but less than \$10K, injury or occupational illness not resulting in a lost work day, or minimal environmental damage not violating law or regulation.

(DAF, 1998(a): 41)

## **Appendix I. Risk Analysis Instrument for Environmental Education and Training**

Probability	Risk and Regulatory Vulnerability			
	A	B	C	D
I	1	1	2	2
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

**Probability.** Potential consequences if training is not completed. Probability categories are:

- I.** Must complete in the immediate training cycle to avoid adverse mission impact and is required by local, state or federal law.
- II.** Required to replace skilled employees. Deferment will cause an adverse impact over an intermediate term.
- III.** Expands the employee's current job skills. Deferment beyond the immediate training cycle will have little mission impact.
- IV.** Increases employee's efficiency and productivity or broadens employee's skills outside the employee's functional area of operations. Deferment beyond the immediate training cycle will have minor mission impact but a reduced multi-disciplinary workforce could delay improvements to mission.

**Risk and Regulatory Vulnerability.** Ties training classification to the probability of increased risk or vulnerability to regulatory enforcement. The categories are:

- A** - Likely to occur
- B** - Probably will occur
- C** - Possibly will occur
- D** - Unlikely to occur

### **Overall Training Assessment Code Description:**

- 1** - Imminent Mission Impact, Must Pay
- 2** - Serious Mission Impact, Must Pay
- 3** - Moderate Mission Impact, Should Pay
- 4** - Minor Mission Impact, Should Pay
- 5** - Negligible Mission Impact, Should Pay

(DAF, 1998(b): paragraph 4.2)

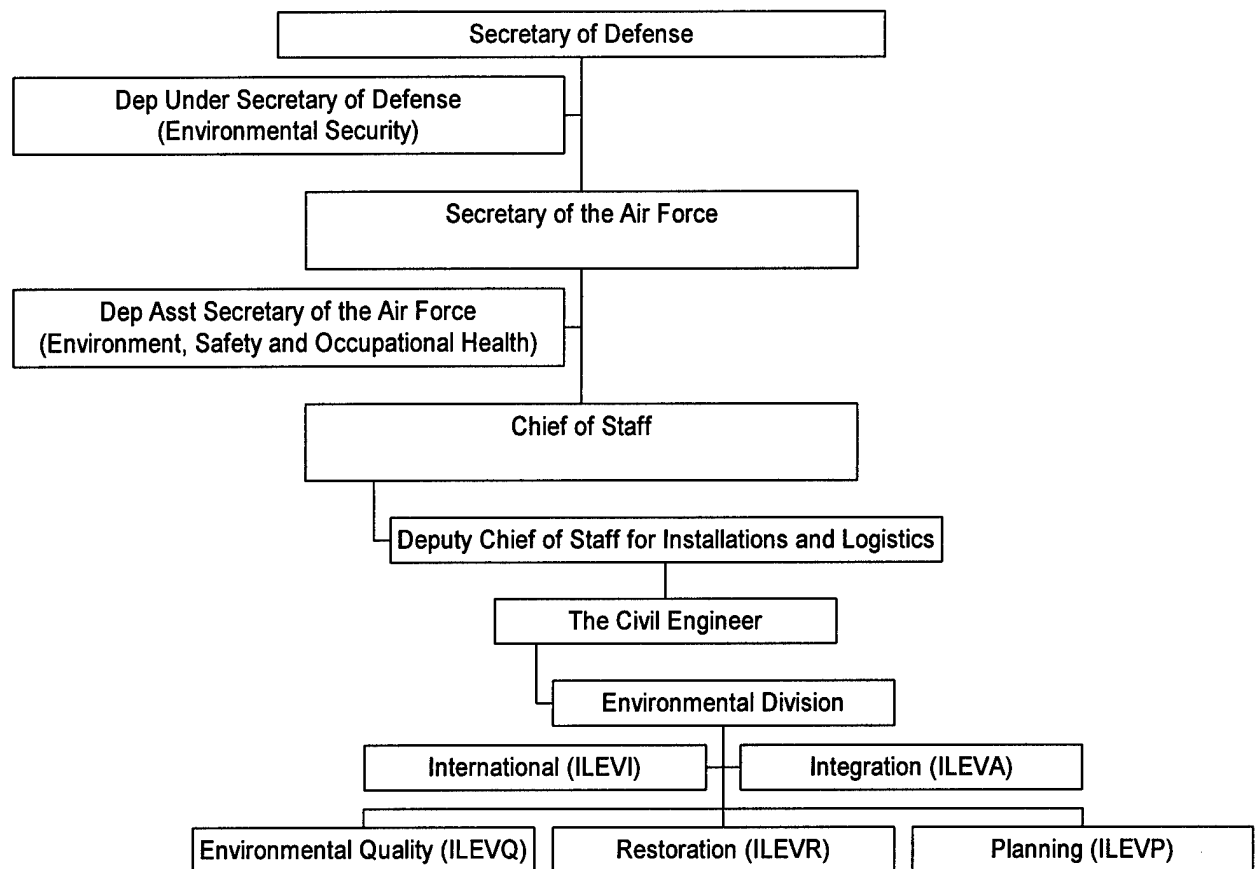
**Appendix J. Budget Estimate Submittal for Environmental Funding, FY00/01 Cycle**

	<b>91</b>	<b>92</b>	<b>93</b>	<b>94</b>	<b>95</b>	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>00</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b>
Conservation	0	0	0	36	42	53	34	64	58	62	61	56	61	62	63
P2	0	0	117	104	129	81	75	60	56	104	101	97	97	96	98
Compliance	255	333	744	617	614	493	413	370	390	383	377	365	357	381	370
Cleanup	<u>386</u>	<u>398</u>	<u>524</u>	<u>513</u>	<u>367</u>	<u>365</u>	<u>394</u>	<u>381</u>	<u>371</u>	<u>383</u>	<u>386</u>	<u>393</u>	<u>401</u>	<u>411</u>	<u>420</u>
<b>TOTAL (\$M):</b>	<b>641</b>	<b>731</b>	<b>1,385</b>	<b>1,270</b>	<b>1,152</b>	<b>992</b>	<b>916</b>	<b>875</b>	<b>875</b>	<b>932</b>	<b>925</b>	<b>911</b>	<b>916</b>	<b>950</b>	<b>951</b>

(Yaktus, 1998(b))



### **Appendix K. Environmental Division Organizational Chart**



**Appendix L. HQ USAF Level EPC Members as Identified in AFI 32-7005**

The Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment (SAF/MI) representative and the Assistant Vice Chief of Staff (HQ USAF/CVA) Co-Chair the EPC

The Assistant Secretary for Acquisition (SAF/AQ)

The Assistant Secretary for Budget (SAF/FM)

The General Counsel (SAF/GC)

The Inspector General (SAF/IG)

Office of Legislative Liaison (SAF/LL)

Office of Public Affairs (SAF/PA)

The Civil Engineer (HQ USAF/CE) is the EPC Executive Secretary

Deputy Chief of Staff (DCS) Installations and Logistics (HQ USAF/IL)

Director, Programs and Evaluation (HQ USAF/PE)

DCS Plans and Operations (HQ USAF/XO)

Chief of Safety (HQ USAF/SE)

The Judge Advocate General (HQ USAF/JA)

DCS Personnel (HQ USAF/DP)

Services (HQ USAF/MW)

DCS Command, Control, Communications and Computers (HQ USAF/SC)

The Surgeon General (HQ USAF/SG)

Chief of Air Force Reserve (HQ USAF/RE), Director, Air National Guard (NGB/CF)

Director, Air Force Base Conversion Agency (AFBCA/DR)

## **Appendix M. Objectives and Goals**

### **HQ USAF Level Objectives and Goals for the Four Pillars:**

#### **Cleanup Pillar Objectives:**

- Reduce Risk to Human Health and the Environment. Take appropriate action, in a timely manner, to reduce or eliminate potential risks to human health and the environment caused by environmental contamination.
- Achieve Compliance. Comply with federal, state and local regulatory requirements and orders pertaining to the cleanup of the environment and eliminate all potential enforcement actions.
- Develop Partnerships. Enhance and sustain our environmental commitment through productive partnering and active community involvement programs.
- Involve Stakeholders. Establish Restoration Advisory Boards (RABs) with federal, state and local regulatory agencies, and the local community, where there is sufficient and sustained community interest, for the purpose of seeking stakeholder input.
- Evaluate Cost and Performance. Use new, innovative, or best available technologies that expedite the cleanup process, lower costs, and achieve the same or better results for cleanup.
- Comply with Legal Agreements. Enter into cleanup agreements when legally required or when deemed in the Air Force and stakeholders' best interest to facilitate cleanup. Continue to comply with all existing agreements. Agreements shall reflect realistic schedules that meet the Air Force Environmental Restoration Account (ERA) funding allocations.
- Prevent future contamination through pollution prevention and waste minimization.
- Consider future land use in developing cleanup strategies.
- Ensure that actions necessary to protect human health and the environment are taken prior to property sale or transfer from the U.S. to any other person or entity in accordance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 120(h) and DoD policy.

(HQ USAF/CEVR, 1996: 3)

#### **Specific goals to implement the above objectives for the Cleanup pillar include:**

- Clean up to a lower risk category, or have remedial systems in place, for:
  - High risk sites: 50% by FY 02; 100% by FY 07
  - Medium risk sites by FY 11
  - Low relative risk sites by FY 14
- Support:
  - Agency for Toxic Substances and Disease Registry (ATSDR)

- Defense and State Memorandum of Agreements (DSMOA)
- Enter new agreements, or adjust existing, using "flexible" schedules and relative-risk ranking
- Update the relative risk evaluation and cost-to-complete estimate for every site  
(Yaktus, 1998(a); Block, 1999)

**Compliance Pillar Objectives:**

- Aggressively manage the closure of remaining open enforcement actions
- Emphasize pollution prevention approaches to:
  - Return to Compliance
  - Maintain Compliance
  - Meet new legal requirements

(Yaktus, 1998(a))

**Specific Goals that tie into the Compliance Pillar Objectives:**

- Eliminate all Open Enforcement Actions (OEAs) by end of FY98
- Zero Notice of Violations (NOVs)

(Newquist, 1997)

**Conservation Pillar Objectives:**

- Ensure environmental resources under Air Force stewardship are managed to protect operational readiness
- Protect and enhance natural & cultural resources
- Apply the National Environmental Policy Act to determine impact of Air Force actions  
(Negri, 1998)

**Specific goals that tie into the Conservation pillar objectives:**

- By FY00, accomplish all Natural and Cultural Resource Management Plans at each Air Force installation
- By FY99, accomplish all Natural and Cultural Resource Inventories at each Air Force installation

(Negri, 1998)

- Locate, inventory and map cultural resources on all USAF bases and ranges by the end of 1998

- Locate, inventory and map threatened and endangered species and wetlands on all USAF bases and ranges by the end of 1998
- Revise funding strategy by December of each year to support budget process  
(Barker, 1999)

### **Pollution Prevention Pillar Objectives and Respective Goals:**

- Objective 1: Permeate all mission areas with the pollution prevention ethic through comprehensive education, training and awareness.
  - Sub-objective 1: Develop an environmentally aware and knowledgeable Air Force Team (including military and civilian personnel) through integrated education and training.
    - a. Employ the Air Force Environmental Education and Training Master Plan to identify and program for education and training requirements.
    - b. Utilize the Interservice Environmental Education Review Board to ensure efficient/effective delivery of educational products with the joint Services.
    - c. Promote pollution prevention awareness at each educational level: basic and technical training, commissioning programs, professional military and continuing education, and base introduction programs.
  - Sub-objective 2: Incorporate the pollution prevention ethic into relationships with other agencies and the public.
    - a. Strengthen working relationships with environmental regulators at all levels.
    - b. Champion partnerships with other Services, agencies, industry, and the public.
  - Sub-objective 3: Recognize outstanding individual, team, and installation pollution prevention contributions through the environmental awards, publicity, and recognition programs at all levels.
  - Sub-objective 4: Ensure installations use internal information sources such as base newspapers, commander's access channel and commander's calls to promote pollution prevention. Installation pollution prevention contributions should also be promoted to the media and community leaders.
- Objective 2: Institutionalize pollution prevention into all phases of the weapon system life cycle.
  - Sub-objective 1: Integrate pollution prevention, system safety, health risk assessments, and environmental impact assessments into the entire life-cycle of weapon systems programs from concept development to final disposal.

a. Develop policies, procedures, training, and contract provisions (to include source selection criteria) to incorporate pollution prevention, system safety, health risk assessments, and environmental impact assessments as described in DODI 5000.2, Part 6, Section I, into the systems engineering activities of every Air Force Single Manager.

b. Focus existing AFMC infrastructure to support Single Managers' Pollution Prevention programs and to share lessons learned and maximize use of resources across Air Force Single Managers, other Services and with industry.

c. Develop and incorporate procedures to ensure pollution prevention, system safety, health risk assessments, and environmental impact assessments are properly addressed during program reviews to include Air Force System Acquisition Review Council and Weapon System Program Assessment Reviews.

d. Develop and incorporate procedures to integrate pollution prevention, system safety, health risk assessments, and environmental impact assessments into weapon system documentation, strategies, plans, and in the planning and awarding of contracts.

e. Identify and/or develop tools (to include life cycle cost estimating) and milestones to support single managers with cost effective pollution prevention decisions.

GOAL: By 31 December 1995, work with OSD PA&E and other Services to develop common methodology for necessary life cycle cost considerations.

- Sub-objective 2: Establish and execute an aggressive program to identify and reduce or eliminate ozone depleting substances (ODSs), toxic chemicals, and extremely hazardous substances procurement generated through the use of technical documentation.

a. Institute policies and procedures to minimize or eliminate the use of the above chemicals and substances. Prioritize efforts first on ODS, then the EPA-17 list of hazardous materials, and finally the remaining toxic and extremely hazardous materials. In ODS, prioritize efforts on solvents (1,1,1 Trichloroethane, then CFC-113), then refrigerants, and finally halons.

GOAL: By 3 August 1995, review all standardized documents as listed in the DODISS and identify opportunities to eliminate and reduce the use of toxic chemicals, ODSs, and extremely hazardous substances.

b. Develop and implement a comprehensive strategy to integrate the identification and tracking of all hazardous materials usage with the identification and elimination of requirements in Air Force Technical Orders, MILSPECs, and MILSTDs that drive that hazardous material usage. The hazardous material usage data generated by installation Hazardous Material Pharmacies will focus senior management attention on the processes and requiring documents responsible for the majority of the overall Air Force usage. The owners of those requiring documents must prioritize their efforts to try to eliminate the requirements in their documents. This strategy should also include a process for tracking and reporting the status of needed changes to standardized document call-outs of hazardous materials being used in the field. Identify a centralized Air Force funding source and, to the maximum extent possible, integrate this effort across all DoD components.

c. Develop and incorporate procedures to evaluate the system safety risks, the occupational health risks, and the environmental impacts associated with process changes inherent to pollution prevention initiatives.

d. Issue clarifying guidance to address the content and timing of the Programmatic Environmental Analysis as a program's Environmental Master Plan as described in DODI 5000.2, Part 6, Section I.

e. Establish procedures to insure that all significant safety, occupational health, and environmental costs are included in the life-cycle cost estimates of Air Force acquisition programs to include analysis of direct/indirect costs, including disposal costs, and other environmental & health costs and benefits.

GOAL: By 3 August 1995, submit any FAR revisions necessary to implement this strategy to the Civilian Agency Acquisition Council.

- Sub-objective 3: Specify requirements for the purchase of environmentally preferable products and services and implement affirmative procurement programs in accordance with the Resource Conservation and Recovery Act, 42 U.S.C. 6962, and Executive Order 12873, Federal Acquisition, Recycling, and Waste Prevention.

a. Implement acquisition policies and practices to integrate affirmative procurement considerations into all acquisition planning.

GOAL: By 31 August 1995, develop AFFARS supplemental guidance to implement aggressive affirmative procurement programs.

GOAL: Develop guidance to meet or exceed the minimum materials content standards when purchasing or causing the purchase of printing and writing paper.

(a) For high speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, and white woven envelopes, the minimum content standard shall be no less than 20 percent postconsumer materials beginning 31 December 1994. This minimum content standard shall be increased to 30 percent beginning on 31 December 1998.

(b) For other uncoated printing and writing paper, such as writing and office paper, book paper, cotton fiber paper, and cover stock, the minimum content standard shall be 50 percent recovered materials, including 20 percent postconsumer materials beginning on 31 December 1994. This standard shall be increased to 30 percent beginning on 31 December 1998.

(c) As an alternative to meeting the standards in goal (a) or (b), for all printing and writing papers, the minimum content standard shall be no less than 50 percent recovered materials that are a waste material byproduct of a finished product other than a paper or textile product which would otherwise be disposed of in a landfill, as determined by the State in which the facility is located.

- Objective 3: Incorporate pollution prevention in all aspects of installation operations.

- Sub-objective 1: Develop, maintain, and implement pollution prevention plans at each installation and facility. These plans should include baselines, pollution prevention

assessments and investment strategies based on compliance with Federal regulations and health based risk assessments.

a. Develop and implement plans to prevent releases and off-site transfers of toxic chemicals to all media.

GOAL: By 1 October 1995, develop installation and government owned-contractor operated (GOCO) Pollution Prevention Plans.

- Sub-objective 2: Minimize or eliminate the use of hazardous materials and ozone depleting substances (ODS) in all activities.

a. Implement the hazardous material pharmacy concept to license, track and control requisitions, receipts, issues, transfers, uses, and dispositions of all hazardous material and ODS.

GOAL: By 1 October 1995, implement hazardous material tracking system at all Air Force bases.

b. Develop plans to eliminate purchases of ozone depleting substances (ODSs) and reduce purchases of EPA 17 Chemicals.

GOAL: By December 1995, develop a refrigerant management plan and a halon management plan at each installation.

GOAL: By 31 December 1996:

- Reduce purchases of EPA 17 Industrial Toxics by 50 percent from 1992 baseline.
- Reduce hazardous waste disposal by 25 percent from 1992 baseline.

GOAL: By 31 December 1999:

- Reduce hazardous waste disposal by 50 percent from 1992 baseline.
- Reduce volatile air emissions by 50 percent from 1993 baseline.

- Sub-objective 3: Implement cost-effective waste reduction at all installations and facilities to include government owned-contractor operated (GOCO) or leased facilities.

GOAL: By 1 October 1995, institute recycling and composting (where possible) at each installation.

GOAL: By 31 December 1996, reduce municipal solid waste disposal by 30 percent from 1992 baseline.

GOAL: By 31 December 1997, reduce municipal solid waste disposal by 50 percent from 1992 baseline.

- Sub-objective 4: Minimize or eliminate releases and off-site transfers of toxic chemical through the use of pollution prevention practices.

a. Establish an Air Force-wide method and metric for documenting release reductions that properly credits activities undertaken prior to the 1994 baseline set in Executive Order 12856.

GOAL: By 1999, achieve a 50 percent reduction of total releases and off-site transfers of toxic chemicals from the 1994 Toxic Release Inventory baseline.



- Sub-objective 5. Develop policy and guidance to ensure that installations comply with Emergency Planning Community Right-to-Know Act (EPCRA) as implemented by Executive Order 12856 with consistent and defensible reports.

a. Develop and maintain a comprehensive inventory of toxic chemicals, ODSs, extremely hazardous substances and hazardous chemicals, and the processes, systems, and management practices that use these chemicals.

b. Foster cooperative approach between installations, their surrounding communities, and the Environmental Protection Agency in complying with the emergency planning and right-to-know requirements.

c. Develop specific methods and procedures that installations can use to verify data prior to submission.

- Sub-objective 6: Support the Department's energy resource management programs to assure all Defense Components comply with the Energy Policy Act of 1992 (P.L. 102-486) and Executive Order 12902 to achieve energy and water conservation, and increased use of renewable energy sources.

a. Implement a comprehensive program to accomplish cost effective conservation in all existing installations and energy systems.

b. Develop and apply incentive programs such as gain sharing, shared energy performance contracting and utility demand side management programs.

c. Design and construct new facilities to minimize the life-cycle cost of the facility by utilizing energy and efficiency techniques and renewable energy technologies.

d. Operate, maintain and upgrade existing facilities to conserve water and energy when cost-effective to do so. Incorporate renewable energy technologies into existing facilities when cost-effective.

GOAL: Revise and issue design guidance to incorporate conservation practices.

GOAL: By 2005, identify and accomplish all energy and water conservation actions which pay back in ten years or less.

GOAL: By 2000, achieve a reduction in facilities energy consumption, as measured in BTUs/SqFt, by 20 percent from the 1985 baseline. By 2005 reduce by 30 percent.

GOAL: By 2005, achieve an increase in industrial facilities energy use efficiency by 20 percent from the 1990 baseline.

- Sub-objective 7: Maximize the use of environmentally friendly materials in the planning, programming, construction and maintenance of facilities and installations.

GOAL: By July 1995, issue guidance to promote the use of environmentally friendly materials in the construction and maintenance of facilities.

- Sub-objective 8: Establish and promote efficient material/energy-use practices through conservation, reutilization, materials substitution, recycling, affirmative procurement and the creation of markets for recycled materials.

GOAL: By July 1995, issue guidance to promote efficient material/energy-use practices in the construction and maintenance of facilities.

- Sub-objective 9: As appropriate, installations' pollution prevention planning and investment strategies must consider environmental justice concerns in accordance with Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations."

a. Identify and address any aspects that could result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

b. Ensure that the planning and investment strategies do not have the effect of excluding persons from participation therein, denying persons the benefits thereof, or subjecting persons to discrimination there under because of their race, color, or national origin.

c. Ensure public participation in and access to information related to the planning and investment strategies in accordance with Executive order 12898, including working to ensure that any public documents, notices, and hearings are concise, understandable, and readily accessible to the public.

GOAL: By February 1996, develop guidance to incorporate environmental justice considerations in pollution prevention planning.

- Sub-objective 10: Fully implement integrated pest management throughout the Air Force to reduce pesticide risk.

GOAL: By 30 September 2000, reduce the amount of pesticide/herbicide applied annually, as measured in pounds of active ingredient, by 50 percent from the FY 1993 baseline.

- Sub-objective 11: Develop and justify a comprehensive pollution prevention budget to obtain resources for high priority projects based on published funding guidance.

- Objective 4: Develop and transition innovative pollution prevention technologies to the field.

- Sub-objective 1: Identify and prioritize Air Force environmental technology needs.

a. Focus pollution prevention R&D on developing and validating critical technologies needed for material and process modification.

GOAL: By December of each year, publish the Prioritized Environmental Technology Needs list.

- Sub-objective 2: Develop an "Air Force Environmental Quality Research, Development, and Acquisition (RD&A) Strategic Plan" which will formulate the resources necessary to address the Air Force's environmental technology needs.

GOAL: By March of each year, publish the strategic plan.

- Sub-objective 3: Transition state of the art pollution prevention technologies developed under the Science and Technology or Manufacturing Technology Programs, or from outside the Air Force, to the field.

- a. Crossfeed ideas through a technology information center, and aggressively market them Air Force-wide.

- Sub-objective 4: Leverage and integrate the Air Force's pollution prevention R&D programs with those of other Federal agencies, academia, and private industry.

- a. Identify material and process substitutes in Defense technologies that have Government-wide and commercial application for expedited implementation.

- b. Foster cooperative intergovernmental and government-industry partnerships/alliances to solve issues of environmental significance.

- c. Actively demonstrate and implement off-the-shelf technologies.

(Air Force P2 Strategy, 1994)

### **HQ ACC Level Objectives and Goals (Focus Areas):**

- Objective 1: Deliver quality environmental products and services that meet or exceed customer needs. The Environmental Division endeavors to improve on its customer service and will use a variety of customer surveys of key customers to evaluate the effectiveness of its programs. Surveys include: Restoration Customer Survey, Quality Customer Survey, Compliance Customer Survey, and an ECAMP Customer Survey.

- Focus 1.1: Restoration Customer Service. Survey all bases on a quarterly basis with a goal of 4.5 on a scale of 1 to 5.

- Focus 1.2: Quality Customer Survey: Provide an environmental quality survey, with a goal of 4.5 on a scale of 1 to 5.

- Focus 1.3: ECAS: Provide ECAS Contract Support which achieves a 95% effectiveness rating by 31 Dec 98.

- Focus 1.4: ECAMP Survey Ratings: Sustain overall excellent customer satisfaction ratings for the external ECAMP program by surveying customers and continue to improve upon the ECAMP Management System software by including the Environmental Compliance Handbook and the Self Assessment Management Checklist.

- Objective 2: Promote internal and external team building efforts to support our mission. The Environmental Division has implemented a variety of Team building initiatives within both the Civil Engineer Directorate and with external customers outside of the ACC/CE Directorate to streamline costs and improve its execution of its environmental mission. These programs are: Expansion of the Restoration Advisory Board program; Improving customer satisfaction on the Environmental Leadership Board; Providing vital training and technology transfer at the annual Environmental

Symposium, and fully supporting the MILCON process through timely submission of all MILCON certificates and EIAP documentation.

- Focus 2.1: Support Restoration Advisory Boards. Support and fund structured partnering efforts where the potential paybacks outweigh the expenditures. Improve community relations through the use of Restoration Advisory Boards at all ACC installations and ensure the bases convene a board at least once every six months.

- Focus 2.2: Improve Customer Satisfaction on ELB/ELC: Improve customer satisfaction on the Command Environmental Leadership Boards to above 4.0.

- Focus 2.3: Environmental Symposium: Provide training, technology transfer, and policy guidance for all ACC environmental programs to ACC installation program managers.

- Focus 2.4: MILCON Certification: Ensure full mission support and timely facility delivery by completing Certificates of Compliance on all FY00 MILCON by 31 Jan 99.

- Focus 2.5: MILCON EIAP. Support the ACC mission and facility delivery by ensuring timely completion of EIAP documentation on all FY98 approved MILCON projects.

- Objective 3: Enhance ACC mission effectiveness by establishing a culture of pollution prevention, conservation, and environmental stewardship.

- Focus 3.1: Reduce Cost of Doing Business for Restoration Program. Implement the ACC/CEVR Reducing the Cost of Doing Business Plan.

- Focus 3.2: Pollution Prevention: Provide leadership, guidance, and resources necessary to protect human health, protect the environment and prevent regulatory enforcement actions through hiring sufficient staff (total of 4 by 1 Jun 98).

- Focus 3.3: Clean Air Act Title V Permits: Comply with all CAA operating permit requirements and reduce the number of permit exceedances to zero by 1 Oct 99.

- Focus 3.4: Drinking Water Compliance: Comply with all SDWA standards by having no primary drinking water standard exceedances by 1 Oct 99.

- Focus 3.5: GSUs: Identify and program corrective actions for environmental compliance deficiencies at all Command Geographically Separated Units (GSUs) by 1 Oct 99.

- Focus 3.6: Solid Waste Reduction: Every year, direct 40% of non-hazardous solid waste away from landfills and/or incinerators, as long as the costs for doing so do not exceed the costs for collection and landfill/incineration by more than 10%.

- Focus 3.7: Hazardous Waste Reduction: Reduce hazardous waste by 80% by 31 Dec 05, as compared to the CY92 baseline.

- Focus 3.8: Hazardous Waste Permits: Reduce the number of HW container storage permits to 3 by 31 Dec 05.

- Focus 3.9: Resource Conservation and Recovery Act (RCRA) Corrective Actions Program: Reduce the number of Solid Waste Management Units (SWMUs) and Areas of

Concern (AOCs) by 25% by 31 Dec 98. Invest less than \$6M per year by using risk-based approach to RCRA corrective actions.

- Focus 3.10: Environmental Incident Investigation Board (EIIB): Apply standard timeline to maintain timely EIIB reporting, staff review and incident closure.

- Focus 3.11: ESORTS Report Accuracy. Assess the relative rating of the ESORTS program for all ACC bases as compared to the ACC environmental pillar standard.

- Focus 3.12: Conservation Execution: Prudently obligate all funds in the year of appropriation.

- Objective 4: Provide the leadership, guidance, and resources necessary to protect human health, protect the environment, and prevent regulatory enforcement actions. The Environmental Division has developed initiatives and programs to lead ACC and the Air Force in environmental stewardship in concert with the local regulatory community to include: Focusing the Restoration program on cleanup, targeting ECP execution and validation, improving P2 execution, increasing the number of compliant USTs, reducing total PCBs, reducing Open Enforcement Actions, making the ECAMP program more consistent, analyzing all bases for outsourcing and privatization opportunities, providing timely completion of all environmental impact statements, and identifying all natural and cultural resources.

- Focus 4.1: Execute ERA projects in a timely fashion. Have all projects awarded by end of the third quarter of FY98. Interim goal of 35 percent for the first quarter and 70 percent for the second quarter.

- Focus 4.2: Restoration focused on clean up. Spend 75 percent of ERA funds on cleaning up IRP sites.

- Focus 4.3: ECP Execution: Improve ECP funds execution by obligating 33% of available non-recurring funds by 31 Dec 97, 67% by 30 Mar 98, and 100% by 30 Jun 98; and 25% of recurring funds by 31 Dec 97, 50% by 30 Mar 98, 75% by 30 Jun 98, and 100% by 30 Sep 98.

- Focus 4.4: FY99-05 ECP/P2 Validation: Validate all upcoming FY99-05 environmental compliance and pollution prevention requirements by 28 Feb 98.

- Focus 4.5: P2 Execution: Improve P2 funds execution by committing 33% of available non-recurring funds by 31 Dec 97, 67% by 30 Mar 98, and 100% by 30 Jun 98; and 25% of recurring funds by 31 Dec 97, 50% by 30 Mar 98, 75% by 30 Jun 98, and 100% by 30 Sep 98.

- Focus 4.6: USTs: Provide the resources necessary for all regulated Underground Storage Tanks (USTs) to be in compliance with Federal and State laws by 22 Dec 98. To achieve this objective, all USTs requiring upgrade or replacement should be contracted during FY97/98.

- Focus 4.7: PCBs: Demonstrate environmental leadership by reducing the number of PCB items under design and under contract for removal/replacement. Report results quarterly.

- Focus 4.8: Open Enforcement Actions (OEAs): Demonstrate Environmental Leadership by closing all Open Enforcement Actions (OEAs) by the end of 1998.
- Focus 4.9: Compliance Agreements: Comply with all compliance agreements by Dec 98.
- Focus 4.10: ECAMP Scheduling: Ensure consistent ECAMP scheduling throughout the assessment cycle.
- Focus 4.11: Outsourcing and Privatization Surveys: Meet with each ACC base to help installations size the environmental advisory staff to be prepared if/when environmental flights become candidates for outsourcing.
- Focus 4.12: Environmental Impact Statements (EISs): Prepare EISs for Nellis AFB Range withdrawal, Enhanced Training in Idaho, Holloman II, and F-22 Operation/Test and Evaluation to support ACC range and airspace training initiatives.
- Focus 4.13: NATURAL/CULTURAL RESOURCES. Identify, protect, conserve, and manage sensitive and significant natural and cultural resources and ecosystems.  
(HQ ACC/CEV, 1998: 4-5)

**Appendix N. ESORTS Criteria Ratings Sheet and Overall Rating Sheet**

<b>CRITERIA RATINGS</b>				
Compliance	Pollution Prevention	Conservation	Restoration	
Eliminating Open Enforcement Actions (OEAs)	Hazardous Material Pharmacy (HAZMART) Implementation	Environmental Impact Analysis Process (EIAP) Management	Installation Restoration Program (IRP) Management	
Compliance with Environmental Permits	Reducing Hazardous Waste Disposal	Currency of Plans, Surveys and Inventories	Complying with Legal Agreements	
Compliance with Legal Agreements	Reducing Solid Waste Disposal	Funds Obligation	Funding Advocacy of IRP Program	
ECAMP Finding Closure	Funds Obligation		Funds Obligation	
Funds Obligation				

<b>Criteria Ratings</b>			
CC Rating	Compliance	Pollution Prevention	Restoration
<b>OVERALL</b>			

- E-1 No Problems
- E-2 Minor Problems
- E-3 Major Problems
- E-4 Program Failure

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